From the College of Physicians, Oct. 5. 1700.

Mr. *Smith*,

I Have Read the Book you sent me, which, for the great Discoveries contain'd therein, is justly Entitled, *The Mysteries of* Opium *Reveal'd*: It has no need of Mine, nor of any other Approbation: For such Extraordinary Performances, as this is, are more secure of a Kind Reception in the World by their own great Worth, and Usefulness to the Publick, than by any other Recommendation whatsoever.

Yours,

THOMAS BURWELL.

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Yours,

THOMAS BURWELL.

8° L. 52. Med.

THE MYSTERIES OF OPIUM Reveal'd,

BY

Dr. JOHN JONES,

Chancellor of Landaff, *a Member of the College of Phyſicians in* LONDON: And formerly *Fellow of* Jeſus-College *in* OXFORD.

WHO,

I. Gives an Account of the *Name, Make, Choice, Effects, &c.* of *Opium.*

II. Proves all former *Opinions of its Operation* to be meer *Chimera's.*

III. Demonſtrates what its *true Cauſe* is; by which he eaſily, and Mechanically explains *all* (even its moſt *myſterious*) *Effects.*

IV. Shews its *noxious Principle,* and how to ſeparate it; thereby rendering it a ſafe, and noble *Panacea*; whereof,

V. He ſhews the *palliative,* and *curative Uſe.*

A DEO LUX.

LONDON:
Printed for *Richard Smith* at the *Angel and Bible* without *Temple-Bar.* MDCC.

BIBLIOTHECA · BODLEIANA

TO THE
KING'S
Moſt Excellent Majeſty,
William III. &c.

May it pleaſe Your Majeſty,

HAving no *Means* to attone for my *bold Eſſay* to expreſs Your MAJESTY's *glorious Acts, and Virtues* upon a *ſmall Pillar*, (as much *too narrow* to contain, as my *Pen* was *too ſhort* to reach *them*) but by this *Poor Sacrifice*, making *one Preſumption* the *Advocate* of the *other*, (as if *Offences* bore no *Proportion* to Your ROYAL *Notice*, and *Clemency* without accumulating them) I humbly implore

GOD's *Representative* in *Mercy*, as well as *Power*, to be a Saviour in *pardoning*, as well as *preserving*. I confess my *Attempt* as *daring* and *assuming*, as that of the Arrogant, and Sturdy *Giants* to scale *Heaven*, being too great a *Task* for a general *Consult* of the most *exalted Wits* on *Earth*, if not of *Angels*, and *refin'd separate Souls*, of whose *Number mine*, by frequent *Ecstasies* of *Thanks*, and *Praises*, for the *Wonders* Your MAJESTY has wrought for us, seems as it were ambitious to be *one*; as well knowing, that such *miraculous Exploits* far transcend the *Conceptions*, and *highest Flights* of those that are clog'd with *Bodies*; which had quite balk'd my *Endeavours* to describe them, but that those *uncontrollable Raptures* used *Violence* upon my *Modesty*, and *a long defeated Expectation* of *better Pens* render'd my *Impatience outragious*, *to find Men silent*, *where they*

they cannot be loud enough; as if the *Impracticableness* of *adequate Thanks* had pall'd their *Spirits*; Or the vast *Cataracts* of *Blessings* Your MAJESTY pour'd upon us had overwhelm'd; Or the consequent *Ease*, and *Security* lull'd them asleep; Or our *exuberant Prosperity* overgrown the *Memory* of its *brave, and generous* Author: The *Thoughts* of which *Ingratitude*, what *Loyal*, or *Moral Heart* can bear without the *highest Indignation*? The *Fret*, and *Ferment* whereof would have even bursted its *Vessel* without the *Vent* I gave it in expressing my *Thoughts* upon that *Pillar*; to *mind* the *forgetful*, *excite* the *Lethargick*, and give all a *Model* by my *Paper-building* to erect more *sumptuous* and *permanent Monuments* of what GOD, and Your MAJESTY's unparallel'd *Magnanimity*, *Courage*, and *Conduct*, have done for us.

Since that was my *Design*, *Gratitude* my *Motive*, Deeds and Quali-

fica-

fications, that have no *commensurate Words*, my *Theme*; I hope *Defects* in *Expression* will not intercept a *gracious Aspect*.

If the *Book* affords any *Thing new*, or *useful*, *Your* MAJESTY is the *Author*, as *Preserver* of our *Lives*, and *Establisher* of the necessary *Tranquillity* for Thoughtful *Studies*, and *Inventions*; therefore I humbly present it to Your most *Sacred* MAJESTY, as *Men* do *Oblations* to the DEITY from whom they receiv'd them; making it (as far as in me lies) doubly Yours, as is,

ROYAL SIR,

Your MAJESTY's

Most { *Humble*, *Obedient*, *Thankful*, } Subject, And Servant,

JOHN JONES.

THE MYSTERIES OF OPIUM Reveal'd.

CHAP. I.

Shews how Opium *had its Name, how 'tis made, whence it comes,* &c.

THE *Opium*, that was in *Uſe* in *Ancient Times*, was made thus:

When the *Poppy* (which was generally the *White*, and ſow'd then only in Gardens, and ſmall Incloſures) was come to its full growth, and moſt turgid of *Milky Juice*, which was in the hot Countries in *May* and *June*; they did, as ſoon as the *Dew* was up in the mornings, make ſeveral Inciſions tranſverſly or *athwart* the Heads of the *Poppies*, yet not directly *horizontal*, but ſomewhat *obliquely*, taking

 car:

care not to make them quite through into the *cavity* thereof; holding the *Knife*, or *Inſtrument*, with which the *Inciſions* were made, with its Edge ſloaping upward, while it wounded the Heads, and conveniently placing certain *Shells* to receive the *Milky Drops*, that iſſued out of the *Inciſions*; and went backward among the *Poppies*, as they proceeded in this *Work*.

1. *They choſe the Time when the Poppy Heads were moſt turgid of Milk*, to take it in the beſt *Condition* for their Purpoſe; for if they gathered it ſooner, it was not ſo Mature, and if afterward, ſome of its *Vertue* expired; and the *quantity* of the Juice was leſs, becauſe dry'd up in ſome meaſure, if not taken timely.

2. *They made ſeveral Inciſions in every Poppy's Head*, to have the greater Plenty of Juice.

3. *They made them immediately after the Dew was up*, to prevent its being tainted with any of the *Dew*; and becauſe the great *Heat* of the *Day*, in thoſe *Countreys*, would much diminiſh the Quantity of the *Milky Juice*, and ſo thicken it, that it would not run out as freely as in the *Mornings*.

4. *They made the Inciſions tranſverſly*, thereby to cut and lay open more of the Milky Veſſels.

5. *They made them ſomewhat obliquely*, that the Drops might the better follow, and overtake one the other, and thereby coaleſce, and grow more conſiderable in *Bulk*, and that the oblique *Wound* might the better conduct them into the ſame part of the *Shells*; that they might find all together in a *maſs*, when it was ſufficiently dried or inſpiſſated by the *Heat* of the Sun.

6. *They did not make the Inciſions quite through*, (if they could avoid it) leſt any of the *Juice* ſhould run into the *Cavity* of the *Head*, and ſo be loſt among the *Seeds* contain'd therein.

7. *They*

7. *They ſloaped the Edge of the Knife, or Inſtrument, upwards, as they made the Inciſions,* that the *Juice* might the eaſier ſlide outwardly; eſpecially in caſe they happened to make the *Inciſions* quite through, which they could not always avoid, notwithſtanding all the *Care* they uſed.

8. *They went backward as they did it,* to avoid going by the *Shells,* and inciſed *Heads*; leſt they ſhould diſorder, or diſcompoſe, or throw them down, or wipe off any of the *Juice* with their Cloaths.

This being done, they left the *Milky Juice* in the *Shells,* to inſpiſſate by the Heat of the Sun into a *Pilular Conſiſtence.* I have been the more particular, to ſhew Men how to make *Opium* of *Engliſh Poppies,* which you'll find of good uſe.

The *Milky Juice,* as it dry'd or thickened, did gradually change its *colour* from *white* to a kind of a *reddiſh yellow* (or tawny) *colour,* not unlike that of a *Lyon's Hair,* which *colour* you may ſtill obſerve on the inſide of our common *Opium,* when rudely torn by *force,* if taken *notice* of upon the tearing; for the *Air* does ſoon blacken it.

This *ſort* of *Opium* gathered in Shells, *&c.* (as is aforeſaid) the *Grecians* (our *Maſters* in *Phyſick,* from whom we derive the Names of many of our *Medicaments, Diſeaſes, &c.*) called Ὀπὸς, which ſignifies *the Juice,* by way of *Eminence*; as we call the *Jeſuits Bark* (*the Bark*) becauſe moſt uſeful, and excellent.

The *Latines,* who had alſo their *Learning,* and *Words* of *Art,* from the *Grecians,* called it *Opium* from Ὀπὸς; it being uſual with them in very many Caſes, particularly in things made out of other Matter (as *Opium* is made out of Ὀπὸς *the Juice*) to change *os* to *um* or *ium,* ſo that Ὀπὸς (or *Opos*) was by them call'd *Opium.*

The *Latines* becoming *Maſters* of the World, and of every Thing that was good and excellent; and all People obſerving their *Manners*, *Faſhions*, *Uſages*, *&c.* ſome of the *Eaſtern People* got the *Uſe* and Name of *Opium* from the *Latines*, which they in Proceſs of Time called *Oſium*, by changing *π* (or *pi*) into *ſi*; which is very common in all *Nations*, becauſe the *natural Purſuit* of *Eaſe*, and *Pleaſure*, in the Run of *Diſcourſe*, changes the *harder*, and *harſher ſounds*, into ſuch as are *eaſier*, and *ſweeter*, when they are *like* in ſound, as *pi* and *ſi* are. The Sound of *π* (or *pi*) is harder than that of *ſi*; 1. Becauſe it quite ſtops the Breath, which the ſound of *ſi* does not. 2. Becauſe the *ſound* of *π* (or *p*) requires the motion of the *Lower Lip* upward, againſt its natural *gravity*, and the motion of the whole *Lower Jaw* upward, by conſent, to help that of the *Lip*; whereas in forming the ſound of *f*, the *Lower Lip* moves only *horizontally*; which is the eaſieſt of Motions, except the Natural motion of *weighty* Things *downward*, or *light* Things upwards; yet are both thoſe Sounds *like* in their *formation* in ſeveral other *reſpects*; as 1. Becauſe both are *non-vocalized Sounds*. 2. Both are *labial*. 3. The *Tongue* lies ſtill in its *Natural Poſition* in forming both. 4. The *Uvula Valve*, which ſhuts up the *Paſſage* of the Breath through the Noſe, is ſhut in forming both; all which ſhews, that the ſound of *π* (or *p*) *m* (or *pi*) is much *harder* to be form'd than that of *f* (or *ſi*) and yet conſiderably *like*; which is the true Cauſe why all Nations are apt to change the harder ſound of *pi* into the *eaſier* and *like* Sound of *ſi* (or of *p* into that of *f*): I put *pi* and *ſi* for *Inſtance*, becauſe the *Likeneſs* appears better in them by having the ſame *Vowel* after both; whereas when you ſay *p* (or *pee*) *f* (or *ef*) the *Difference* of the *Vowels* added, and the *ſound* of

of *ee* put after *p*, and of *e* before *f*, (to help the Conſonants to ſound) makes them ſeem unlike, by reaſon of the different *Vowels*, ſo differently placed; whereas *pi* and *fi*, having the ſame *Vowel* alike placed after them, do truly ſhew their *likeneſs* without *confuſion*. It is by Reaſon of this *Likeneſs*,

That { *Sapphick*, *Sapphire*, &c. } Are ſounded { *Saf-fick*. *Saf-fire*, or *Safire*. }

That Τρόπαιον is Tranſlated *Trophæum* (or *Trofæum*) a *Trophy*.

Beſides, that the *Arabians* did and do very commonly change *p* to *f*,

Saying { *Faunia*, *Ofium*, &c. } For { *Poeonia*. *Opium*. &c. }

And this *likeneſs* of the Sound of *p* and *f*, is the *Reaſon* why *ph* is written for *f*, becauſe *h* ſignifies the *ſound* of *Breath* expired, which if you uſe upon ſounding *p*, it will be the ſound of *f*; ſo that *f* is a kind of a breathing *p*, that is *ph*.

Of which Matter, the Curious in ſuch Things may find more to their ſatisfaction in my *Phonography*, when publiſhed, which, I hope, will be ſuddenly, if not before this Book.

They call it, in ſome of the *Eaſtern* Countries, *Affium*, or *Affion*, inſtead of *Ofium*, it being uſual in all *Countries* to change the *harder*, and *harſher ſound* of *o*, to that of *a*, which is like it, but *eaſier* and *ſweeter*. It is hence,

That we are apt to say { *Carat*, *Fagat*, *Flagan*, *Wagan*, *&c.* } For { *Carot*, *Fagot*. *Flagon*. *Wagon*, *&c.* }

Changing the Sound of *o* to that of *a*; because the Sound of *a* is easier, and not unlike that of *o* (as was said.)

Some in those Parts call it *Amphion*, (or *Ampion*) for like *Reasons*, all (doubtless) deriving the *Names*, that I have mentioned, from the *Greek Word* Ὄπος, the *Latines* saying *Opium*, (whence we have it) the *Arabians Ofium*; and some other *Eastern* People *Afium*, or *Affium*, and others *Amphion*, *&c.*

The best *Opium*, that was in *Use* in those *ancient Times*, was had from *Thebes*, the Chief *Town* (or *City*) of the Country of *Thebais* in *Egypt*, (not *Thebes* in *Bœotia*, or *Cicilia*) which is now called *Theves*; Because, as *p* is apt to take the *sound* of *f*, so *p* and *b* are much more apt to take the *sound* of *v*, which is (as it were) a sweeter sort of *f*, with which it exactly agrees in its *formation*, but that the *sound* of *v* is *vocalized*, (which sweetens it) and that of *f* is not. It is from the *aptitude* of the sound of *b* and *p*, to change into the most sweet *sound* of *v*,

1. That Children say, *Marvel* for *Marble*, *&c.*

2. That *b* or *β* in { *Ebur*, *Guberno*, Δαβὶδ, Βάδω, Βιρνέλιος, Βάῤῥων, Βιοτὴ, } Is translated to *v* in { *Ivory*. *Govern*. *David*. *Vado*. *Virgilius*. *Varro*. *Vita*. }

3. That

3. That *p* in { *Sapor*, *Papilio*, *Præpoſitus*, } Is tranſlated to *v* in { *Savour*, *Pavilion*, *Provoſt*. }

Which changing of *b* and *p* to *v*, muſt doubtleſs happen in other *Languages*, as well as thoſe I mentioned, becauſe the *ſound* of *v* is ſo much *eaſier*, and *ſweeter*, than either; yet like them in *ſound*.

But the *ſound* of *b* is more like that of *v*, becauſe the ſound of both are *vocalized*, which that of *p* (as has been ſaid) is not; ſo that *b* and *v* agree exactly as *p* and *f*; This makes the *Egyptians* ſay *Theves* for *Thebes*, as the *Arabians* ſay *Ofium* for *Opium*.

Who knows, but this may be the cauſe why *P* is a kind of ſhut *F*, and *F* a kind of an open *P*; for ſuppoſe *P* opened at the round part, to ſignifie that the Lips are not cloſed in ſounding *F*, and that the lower ſtroak or part be left ſhorter, to ſignifie that the lower Lip is drawn inward in ſounding *F*, the *P* becomes a perfect *F*.

The *Reaſons* why the *Opium*, that came from *Thebes*, (now called *Theves*) was, and is the beſt, are, 1. That *Thebes* (or *Theves*) being in *Egypt*, lies in a hotter Country, that is, nearer the *Line* (or *Equator*) than any of the Countries on the North-ſide of the *Mediterranean*; for it is obſerved, that the *Heat* of *Climates* contributes very much to the *Strength* of *Opium*, which is weaker if you make it in *England* or *Germany*, than in *France*; in the Northern Parts of *France*, than in *Languedoc*, which borders upon the *Mediterranean*; and weaker there than in *Smirna*, *Natolia*, *Aleppo*,

and *Apulia*, which are more Southern; and weaker in thoſe Places than in *Thebaïs* in *Egypt*: For which cauſe we may Judge, that the *Opium* which comes to *England* from the *Eaſt-Indies*, that is yet hotter than *Egypt*, being much worſe than that of *Thebes*, (or *Theves*) muſt in all probability be adulterated, or made of the *Leaves* and *Stems* of the *Poppy*, (as ſome ſay) otherwiſe it would be rather better, as coming from the hotter Country. 2. That of *Thebes* may be better, becauſe the Heat of *Egypt* is more conſtant, and uniform, than in *Natolia*, *Aleppo*, *Smirna*, *&c.*

The Quantity of *Opium* which was gathered by the *Milky Juice* of the *Poppy's Heads*, dropping into *Shells* out of the *Inciſions* aforeſaid, being but ſmall; and the *Uſe* of this moſt noble, pleaſing, and generous of *Cordials*, and *Medicaments*, daily increaſing, by the *conſtant* and infallible *Benefit* they found thereby; Men, partly to avoid the *tedioufneſs* of gathering it by *Drops*, and partly out of *neceſſity*, but mainly ('tis to be doubted) out of *covetouſneſs*, began to bruiſe and pound the *Poppy's Heads*, and to ſqueeze out the *Juice*, for *Expedition* and *Quantitie's* ſake; which bruiſing, and ſqueeſing, cauſed it to look blackiſh.

This the *Greeks*, for Diſtinction's ſake, called Μηκώνιον, from the Word Μήκων, which ſignifies *Poppy*; ſtill calling the better *ſort*, which was gathered in Shells out of the Inciſions of the *Poppy's Heads*, Ὄπιον.

Thus have you the true Original of Ὄπιον, and Μηκώνιον, which the *Latines* (and we from them) call *Opium*, and *Meconium*; Tho' (as it happens in moſt Things in Merchandiſe, to recommend the *Goods*) we now call the *Meconium*, *Opium*, by the *better Name*, as they do in another caſe (out of abundance of abſurd Civility) call every *Quack* a *Doctor*.

After-

Afterward (its *Use* growing more and more) they added the *Leaves* to the *Poppy's Heads* in the pounding, bruizing, and expreſſing the *Juice*, boiling it for ſpeed's ſake to the conſiſtence of a *Confection*; which cooling, comes to the conſiſtence that we have it in (I mean the freſher and ſofter ſort that we have) which by the forcible pounding, ſqueezing, and boiling, contracts a blackiſh *Colour* like that of *Horſe-Aloes* on the out-ſide, to which *Colour* the *Air* does very much contribute, and preſſing the Superficies cloſe together; for if you rudely tear a piece of that we have (which is all of this laſt kind) it looks at firſt (as was ſaid) of a *reddiſh Yellow*; but the *Air*, eſpecially if moiſt, or any *Moiſture*, and handling of it, and cloſing the Superficies together, ſoon makes it look blackiſh again. This (as was intimated) is that we now call *Opium*, and have in common *Uſe*.

Which being alſo in common *Uſe* among the *Grecians* when the *Turks* Conquer'd them, was by the *Grecians* themſelves called *Pous* (or *Pos* with the *o* mouthed widely) which came doubtleſly from ὀπός; the *Meconium* at laſt gaining the better Name of ὀπός (or *Pous* or *Pos*) after the manner aforeſaid to recommend it (as all *Opium* is now call'd *Theban*) and the *O* in the beginning of ὀπός, paſſed over in the Run of Diſcourſe, which is not uncommon with *Vowels*, becauſe of their *flat Sound*, which is ſo by reaſon of the wide Paſſage that the *Breath* has between the *Tongue* and the *Palate* in the Formation thereof; for *Wideneſs* of Paſſage is the cauſe of *Flatneſs*; as *Narrowneſs* (in *Birds*, *Children*, &c.) is the cauſe of *Sharpneſs* of *Sound*; therefore the *Sound* of *Vowels* being *flat*, *fading*, and conſequently not as much miſſed as *ſharper Sounds*, we often omit *Vowels*, particularly in the beginning of *Words*, for Eaſe and Shortneſs ſake. Thus it comes to paſs,

That

That Men say { *Potheeary*, *Prentice*, *Buttals*, *Larum*, *Light*, Pos (or Pus) } For { Apothecary. Apprentice. Abuttals. Alarum. Alight. Ὁπος }

And as Ὁπος came to be sounded Pos, so Pos (as naturally) to be sounded Pus (or *Pous*) because it is easier to sound *u* after *o* in this and some other cases, than to omit it, as it is easier to sound *p* between *m* and *t* &c. than not; as in *tempt*, *crumpt*, *limpt*, &c. which are more easily so sounded, than if the sound of *p* were left out, which I call *Easiness* of *Consequence*. Hence it is

That { *Bold*, *Sold*, *Hold*, *Bolt*, *Toll*, *Toll* &c. } Are sounded { Bould. Sould. Hould. Boult. Joul. Toul. &c. }

Changing the *o* into *ou*, as the *Grecians* did *Pos* to *Pous*. For this and such reasons it is, that the *National Greek* can hardly be understood by *Scholars*, when spoken by the *Natives*.

It is for the same Reason, that the *Greeks* write *Greek*, (as we do *English*, and the *French* do their Language) different from what they speak; so that if any Man should learn *French*, or *English*, and always sound it as it is *writ*, or *printed*, he would very hardly understand them, as they are vulgarly *spoken*; which is the very Case of such as learn *Greek* by *Book*, who always sound every Letter,

Letter, whereas the *Native Greeks* do (what all Nations do more or leſs) ſhorten, and alter the Sound of Words in the Common *Run* of Diſcourſe by a natural Propenſity unto, and Purſuit of *Eaſe*, *Pleaſure*, and *Speed*, which by degrees very much alters the Sound of Words.

The *Turks* having been uſed to call the better *Sort*, that dropt out of the *Inciſions* made in the *Poppy Heads*, *Maſſack*, continued that Name to that Sort after they Conquer'd *Greece*, and call'd the other *Sorf*, which they found in Uſe among the *Grecians* by the Name that the *Grecians* gave it, *viz.* *Pous*; and ſuch as commonly uſe it they call *Pouſti* by way of Contempt, as if we ſhould ſay *Small beer-Drinkers*, in compariſon of *Wine-Drinkers*.

You may eaſily perceive by what has been ſaid, *Why* our *Opium* hath ſo much Filth in it.

Why it taſtes ſometimes of an *Empyreum*, or *Burning*, in not ſtirring it well while it is boiling into a *Conſiſtence*, and not giving it only a gentle Heat when it begins to thicken, gradually leſſening the Fire, or letting it conveniently decay, and go out of it ſelf; which is a very good *Way* for ſuch as have not other Conveniences; for as the Matter thickens, the *Heat* declines, and ſo becomes ſafe from a Taſte of Burning, if the Fire be duly proportion'd: But all this *Trouble* is avoided by inſpiſſating by the *Heat* of the Sun, which is uſed in ſome Countries.

Note, That the Poppy of which *Opium* is made, in all *Turky*, *Egypt*, *Thebes*, &c. is the great White *Poppy*, which grows very freely in thoſe Parts, and (as I am inform'd) without any manuring of the Ground in ſome Places; certain it is, that they now have whole *Fields* of that White Poppy, out of which they make the *Opium*, as is aforeſaid, by *pounding*, *preſſing*, *boiling*, &c.

CHAP.

CHAP. II.

Of the Election (or Choice) *of Opium.*

ALL *Opium* being made in ancient Times by the *Milky Drops* that fell out of the *Inciſions* mention'd in the laſt Chapter, which being a natural and ſimple way, made no difference in the *Opium*, but what Nature it ſelf did; all their Knowledge of the beſt *Opium* conſiſted in diſtinguiſhing the *Theban* from other *Opium*, which was not naturally ſo good.

1. *Theban Opium* was of a lighter *Reddiſh Yellow* than other ſorts, therefore ſome call'd it *White Opium*, not that it was abſolutely white, but only relatively ſuch in compariſon with other *kinds* of *Opium*; as we ſay *White Roſin*, in reſpect of other *Roſin*, thô it is not *white*, but only lighter coloured than other *Roſins*.

2. *Theban Opium* was moſt hot, bitter, and biting in taſte, from whence you may infer, that the *Opium* which has thoſe qualities in the higheſt *degree* is the beſt.

3. It ſmelled rankly, and vehemently of the *Poppy*, which gives you another good ſign to judge of *Opium*.

4. It burnt with a clearer Flame than any other.

5. Some ſay, that it was weightier than other ſorts. Notwithſtanding all which Differences, they did in *time* find ways to adulterate it, which were theſe:

1. They adulterated it with Juice of *Glauciam*, (or *Apple* of *Love*.)

This

This was discernable by the *Yellow Tincture*, that it gave to *Water*, and other *Menstruums*; whereas the *Theban*, and all true *Opium* gives a *Red Tincture*.

2. It was counterfeited with *resinous Things*.

This Cheat was discoverable by its not being uniform, nor so dissolvable in *Water* as good *Opium*.

3. It was mix'd with Juice of *Lactuca Sylvestris*, or *Wild Endive leav'd Lettuce*.

This made it of a duller *colour*, and not to smell so perfectly and rankly of the *Poppy*.

4. It was sometimes mix'd with the *Milky Juice* of *Spurge*, which being *hot*, *bitter*, and *biting*, was hardly discernable, but by its purging and disturbing quality, and somewhat less and different.

You may be sure, that *this*, and all the other *Mixtures* lessen'd its *Vertue* as an *Opiate*, if considered in the same quantity, because they must take up room in the *Mass*; but *Lactuca Sylvestris* being of the nature of *Opium*, made the loss of its *Vertue* less discernable.

It is true, that we have none of the *Opium* that was gathered by the *milky Drops* out of the *Incisions*; and therefore what is said, doth not much concern us as to that sort; however these *Observations* will enlighten us as to the *Opium* that we now have.

Of which I cannot find, that there is much *Adulteration* used, because (I suppose) that it is now grown considerably cheaper, by reason of the vast *quantities* that is made, with so much ease, that it is not worth while to counterfeit it, there being now great Fields of *Poppy* in *Turky*; so that our business will be rather to distinguish the *Sort*, than the *Adulteration*; thô this shall not pass unregarded, as far as it may concern us.

There

There are two sorts brought over to us; *one* from *Persia* and the *East-Indies*; the *other* from *Turky*, as from *Lesser Asia*, (or *Natolia*) *Smyrna*, *Aleppo*, &c.

I. That which is brought from *East-India*, *Persia*, *Surat*, &c. is (as I am inform'd) made of the Leaves and Stems of the *Poppy*, and is,

1. More full of *Filth* within it, (for the outside is not so much to be regarded, because of *Accidents*.)

2. It is not so *uniform*, *smooth*, and *supple*, but harsh and rugged.

3. It is not so readily dissolvable in Water.

4. The *Indian* is brought over in *larger Pieces*.

5. It is not brought so wrapt in Leaves as the *Turky Opium* is.

Bontius says, that they make it of the *Stems* and *Leaves*; if so, it must be much worse than the *Turky Opium*, that is made of the *Heads* and *Leaves*.

II. Among those sorts that are brought out of *Turky*, (and indeed any sorts of *Opium*)

1. That is best that is most *bitter*, *hot*, and *biting*.

2. The *lighter*, *whiter*, and clearer its *Flame* is, when it burns, the better it is.

3. The more *uniform*, *even*, *smooth*, *tough*, *yielding*, and *complying* it is to be wrought, or brought to any *form*, the better it is.

4. *The more it gives*, *upon*, *or against moist Weather*, or in a moist *Air* of any *kind*, and the better, speedier, freer, and more perfectly it dissolves in *Water*, the better it is.

5. *The redder the Tincture is that it gives in Water*, Spirit of Wine, or any *Menstruum*, the better it is; and 'tis never good if it gives only a *yellow Tincture*.

But

But *Note*, That even the beſt *Opium*, if you take but a very ſlight *Tincture* thereof, will appear yellowiſh, eſpecially in a *white Veſſel*. Therefore my meaning is, that the redder Tincture *Opium* cauſes in *Water*, quantity for quantity, the better it is.

6. *It ſhould have no taſte or ſmell of an Empyreum*, or Burning; for that gives it a nauſeous taſte, and in ſome meaſure ſignifies a loſs of its Vertue by burning, thô this may be inconſiderable.

7. *The leſs Filth it has on the inſide, the better it is.*

8. *The more it ſparkles when cut, and afterward breath'd* upon three or four times, the truer is the *Opium*; for thoſe *ſparkling Particles* are its noble *Volatile Salt*, (or *Sal-Volatile-oleoſum*) and not its *reſinous Parts*, as *Wedelcus*, and others affirm. 1. Becauſe when the *Roſin* and *Volatile Salt* are ſeparated, that ſparkling follows the *Volatile Parts* and not the *Roſin*, wherein they do not appear in the leaſt. 2. Becauſe I find that they are the *Parts* that are moſt apt to diſſolve in *Water*, which the *Roſin* is not. 3. Becauſe they are much altered by a warm and moiſt *Breath*, which the reſinous Part is not. 4. How could that *Opium* be the beſt (as 'tis found to be) that has moſt of them, if it were the *Roſin*, which is the worſt Part of *Opium*? But 'tis highly conſonant to *Experience*, that they ſhould be the *Volatile*, or *beſt Parts* of *Opium*, which is ſo much the better, the more it abounds with them.

9. *If it yields any other Tincture than Red, it is not right*; and the duller or paler the Red is, the worſe or weaker it is.

10. *The beſt is heavier in proportion to its Bulk*, which you may ſoon experiment thus:

Weigh

Weigh an *Ounce* of each in the *Air*, then weigh them (juſt as they are) in the Braſs Scales in *Water*, and the heavier will out-weigh the other in *Water*; for the heavier any thing is, the leſs *Water* takes from its *Weight* in proportion to its *Bulk*; this is an infallible, and moſt ready *way* to know the *Weight* of any thing in proportion to its *Bulk*.

Note, That my *Diſcourſe* is moſt particularly concerning the beſt ſort of *Crude Turky Opium*; that is the beſt that we have in common *Uſe*, and that its *Effects* and not thoſe of any *Preparation* thereof, are ſet down in the following *Chapters*.

CHAP.

CHAP III.

The Effects of Opium *uſed externally.*

OPIUM uſed *externally* has two ſorts of Effects upon a Humane Body: 1. As, an *Opiate* to cauſe Sleep, take away Pain, *&c.* 2. As an *Alterative* of the Parts it is applied to.

I. *As an Opiate:* It is of very uncertain and uneven *Effects*, when applied *externally*; for ſometimes it cauſes *Sleep*, takes away *Pain*; but it often fails; therefore it is generally much better, ſafer, more certain, and effectual, to uſe it *internally*. I do ſcarce know the caſe wherein 'tis better to uſe it *externally* than *internally*, unleſs it be to ſmell to in ſome caſes: But of theſe Things, more particularly, when we come to the *Uſe* of Opium in *Curing*, *Preventing*, or *Paliating Diſeaſes*; for here we only lay down *Effects*, in order to a *Diſquiſition* of the Cauſe of the Operation of *Opium*, to which its *internal Effects* will mainly contribute; however, it may be very uſeful to that end, to lay down its *alterative Effects*, for thereby we ſhall in good meaſure know the *Principles* by which it operates.

II. Its *external Effects*, as an *Alterative*, are theſe, *viz.*

1. It *incides*, *reſolves*, and *diſcuſſes*.
2. It *relaxes* and *mollifies*.
3. It *maturates* and *ſuppurates*.
4. It *exulcerates*, or *cauſes Bliſters*, if it be very ſtrong, and applied to *Perſons* of a fine *Texture*,

where the Skin is tender; but this *Effect* belongs more properly to the *Maſtack*, or true Ὀπός, that drops from the *Inciſions* made in the *Heads* of the *Poppies*, eſpecially the *Theban*, which affords a very powerful Juice. Hence you may obſerve, that the more it *exulcerates*, or *bliſters*, the better is the *Opium*, *& vice verſâ*.

5. It *is a Pſilotherick*, for it prevents Hair to grow, and cauſes the ſhedding thereof.

6. It *is hurtful to the Eyes* and *Ears*.

7. It *excites Itchings*, applied (in a moderate manner) to the Skin.

8. It *excites Venery*, applied to the *Perinæum*.

CHAP.

CHAP. IV.

The Effects of Opium *uſed Internally, in a moderate Doſe.*

1. THE *moderate Doſe* in *ordinary Uſe*, to produce the following *Effects*, is from one to three *Grains*, (more or leſs) according to the *Circumſtance*, *Condition*, *Caſe*, *Conſtitution*, *Age*, *&c.* of the Perſon who takes it.

2. It operates generally in a *ſhort time* after it is in the *Stomach*, that is, in about *half* an *Hour*, (more or leſs) if taken in a *liquid Form*; and in about an *Hour* (more or leſs) if in a ſolid Form, drinking a *Draught* of *Water*, or ſome *Liquor*, after it; otherwiſe it may be ſometimes near an *Hour* and a *half* before it has its full *Effect*. But the time of its Operation has a conſiderable *Latitude*, according to the Diſpoſition of the *Stomack*, and other Circumſtances, as the *Vehicle* it is taken in, *&c.*

The conſtant Effects of Opium, *uſed internally in a moderate Doſe.*

1. *It cauſes a moſt agreeable, pleaſant, and charming Senſation about the Region of the Stomach,* which if one lies, or ſits ſtill, diffuſes it ſelf in a kind of *indefinite manner*, ſeizing one not unlike the gentle, ſweet *Deliquium* that we find upon our entrance into a moſt agreeable *Slumber*, which, upon yielding to it, generally ends in *Sleep*: But if the Perſon keeps himſelf in *Action*, *Diſcourſe*, or *Buſineſs*, it ſeems (eſpecially when given in a *Morning*, after a moderate Reſt at Night) like a moſt delicious and extraordinary *Refreſhment* of the Spirits upon very *good News*, or any other great cauſe of *Joy*, as the ſight of a dearly beloved Perſon, *&c.* thought to have been loſt at *Sea*, or the like, cauſing ſuch a pleaſant *Ovation* of the *Spirits*, *Serenity*, *&c.* as we find after a competent Meaſure of *generous Wine ad Hilaritatem*, (as Men uſe to ſay.)

It is indeed ſo unexpreſſibly fine and ſweet a *Pleaſure*, that it is very difficult for me to deſcribe, or any to conceive it, but ſuch as actually feel it; for 'tis as if a *Good Genius* poſſeſſed, or informed a Man; therefore People do commonly call it a *heavenly Condition*, as if no *worldly Pleaſure* was to be compar'd with it: *Helmontianus* would doubtleſs expreſs it by the *Archeus* in his very beſt *Humour*.

It has been compar'd (not without good cauſe) to a permanent gentle *Degree* of that Pleaſure, which Modeſty forbids the naming of; and 'tis well worth a Remark, that both are *Pleaſures* of the ſame Senſe, *viz.* that of *Feeling*; for it cannot be a Pleaſure of any other *Senſe*, ſince it is *internal*.

II. *It*

2. *It causes a brisk, gay, and good Humour:* Nor do I doubt but it has this *Effect* upon sleeping Persons, as far as their Condition is capable of observing it; for you shall have them often tell of *pleasant Dreams* after it, when they remember them, and speak of any. See *Bauchin*, and the *Authors* mentioned below under the 4th *Effect* of *Opium*.

3. *It causes Promptitude, Serenity, Alacrity, and Expeditenes in Dispatching and Managing of Busines:* To which *end*, and that of a good and gay Humour (which are near of *kind*) it is commonly taken in the Morning in the *Eastern Countries*, with most certain *Effect*.

The truth of which *Wedelius* is forced to confess, though quite contrary to his *Hypothesis* of *Opium*'s *fixing and coagulating the Spirits*; giving an instance of "*a certain serene Person, who when she* "*had any Affair of great moment to dispatch, did (be-*"*fore-hand) take* Opium *with great advantage; for* "*she thereby found her self every way better disposed* "*for Business, and more enabled to bear the Fatigue* "*thereof.* Which is the *Substance* of what he writes in *Latin*.

Many other *Authors* confirm the *Truth* of these *Effects*; but (above all) the constant Experience of the *Eastern Nations*, puts it out of all doubt.

4. *It causes Assurance, Ovation of the Spirits, Courage, Contempt of Danger, and Magnanimity*, much after the manner that *generous Wine* does; instead of which, the *Turks, &c.* use *Opium* before *Engagements*, desperate *Attacks, &c.* (as is most notorious) to make them Courageous, which it certainly does: For your satisfaction as to this, and other *Effects* of *Opium*, not so commonly observed with us, for *Reasons* given in *Chap.* VIII. See *Bellonius, l.* 3. *c.* 15. *p.* 179. *Erastus Disp. de Sapor. p.* 65. *Georg. Andreæ Itenerar. Ind. l.* 2. *c.* 9. *p.* 12. *Camerar. Oper. Subcis. l.* 1. *c.* 93. *p.* 437. *Erastus Disp. de Nar-*

cot. Oberndorf. Hiſtorians alſo add, That when the *Great Turk* makes a conſiderable *War*, the Soldiers buy up all or moſt of the *Opium*; which may be worth a *Merchant's* Obſervation; for it thereupon grows dear, and is much cheaper in times of *Peace.*

5. *It prevents and takes away Grief, Fear, Anxieties, Peeviſhneſs, Fretfulneſs, &c.* Theſe are neceſſary Conſequences of the former *Effects.*

6. *It cauſes Euphory, or eaſie undergoing of all Labour, Journeys, &c.* and that far beyond all *Wines* and hot *Cordials*, or *Spirits*; therefore it is very much uſed in *Turky* and the *Eaſtern Countries*, in laborious Undertakings, great *Journeys*, *&c.* which Men perform by the *help* of *Opium*, after a prodigious and almoſt incredible manner: But the *Matter of Fact* is ſo common and uſual, that there is no *place* of *doubt*; beſides, that ſome who tried it among us, have found it ſo.

7. *It lulls, ſooths, and* (as it were) *charms the Mind with Satisfaction, Acquieſcence, Contentation, Equanimity, &c.* How ſhould it fail to cauſe theſe *Effects*, ſince it cauſes all the former *gay*, *pleaſant*, and *brave Humours*?

Dr. *Willis*, and *others*, having no true *Experience*, or Knowledge, of *Opium*, imagined that it cauſed *Courage*, *Bravery*, *Equanimity*, *&c.* by ſtupifying the *Senſes*, *Brain*, *&c.* making People inadvertent, dull, and inapprehenſive; which is a great *Miſtake*, and a groundleſs Conceit; for it is a moſt certain Truth (which millions can affirm) that it produces thoſe *Effects* by an *Ovation* and *Pleaſure* of the *ſenſitive Soul* and *Spirits*, as *generous Wine* does before Men are ſuddled, or overcome with it; How elſe could they at the ſame *time* be more *ſerene*, and apt for the Management of any Buſineſs, and neat *Diſpatch* of Affairs, as it is moſt certain they are? Theſe *fundamental* Miſtakes about *Opium*, have been

been (as you'll find hereafter) one great *cauſe* why its *Operations* have puzzled and quite baffled all *Enquirers.*

8. *It quiets, allays, and compoſes all Perturbations and Commotions of the Spirits,* (or ſenſitive Soul) *Bloud, Humours, &c.* as in *Hyſterical* Caſes, *Diary Fevers,* that proceed from Paſſions; as, *Anger, Grief, Terrours, &c.* from *violent Motion, Labour, Heat, Journeys, Convulſions, &c.* or from *Pain*; and *ſtops Bleedings* that proceed from ſuch *Commotions.*

9. *It cauſes a Relaxation of all the ſenſible Parts of the Body,* as the Membranous and Nervous: This is notorious by its *Effects,* as cauſing *Perſpiration, Sweat, Relaxation* of *Sphincters, Vilatation* of the Pupil of the *Eye, Relaxation* of the *Cornea,* and all other *Effects* of *Relaxation,* as you'll find more particularly hereafter.

10. *It cauſes Indolence, or exemption from Pain,* (as all know and allow) and that when *Sleep* does not intervene.

11. *It ſtops, moderates, cures, or paliates all Fluxes,* excepting thoſe by the *Pores,* or ſuch as depend (as that does) upon *Relaxation,* as when *Sphincters* are weak, or paralytical; but theſe laſt are unnatural *Accidents.*

12. *It mightily promotes inſenſible Perſpiration.*

13. *It prevents Shiverings in Ague-Fits, and ſuch-like Caſes, if given in due time and quantity,* which ſhall be ſhown in the *Curative Part.*

14. *It prevents and cures Colds.*

15. *It cauſes a larger and ſlower Pulſe,* ſuppoſing no accidental *Cauſe* to the contrary.

16. *It cauſes Drineſs in the Mouth.*

17. *It has moſt Effect in warm and moiſt Weather.*

18. *It has more Effect upon lax and fine textured Perſons, as Women, Children, &c.* therefore Women ſeldom uſe it in *Turky,* and the other *Eaſtern*

Countries; where it is commonly uſed by the Men.

19. *It cauſes an Efflorescence of the Skin*, barring Accidents of *Cold*, *&c.*

20. *It is obſerved by all, that it mainly affects the* Genus Nervoſum, *and animal Spirits*, and not the *Bloud* and *Humors*.

21. *It increaſes Seed in ſome meaſure.*

22. *It cauſes a great promptitude to Venery, Erections*, &c. *eſpecially if the Doſe be larger than ordinary*; which I would have Men believe without experimenting it; not that I fear to be confuted, but leſt any ſhould injure themſelves by too great a *Doſe*.

This is one great Cauſe (if not the chief) why the *Infidels* of *Turky*, and the *Eaſtern Nations* (eſpecially where *Poligamy* is allow'd, as among the *Turks*, *&c.*) uſe *Opium* ſo much, it never failing to produce this Effect in *hale* and *healthy People*, if the *Doſe* be ſufficient; as is too notorious in all (or moſt) Countries from *Greece* to *Japan* incluſively, who uſe *Opium* for that end.

But as to the *Truth* of this Effect of *Opium*, not only *Authors*, and all the People of thoſe *Eaſtern Nations*, but ſeveral *Merchants*, *Factors*, and *Travellers*, now living in *London*, can atteſt, That it is uſed, for that purpoſe, in thoſe Countries with *Effect*; yea, ſome in our own Nation, that uſe *Opium* in large *Doſes*, can atteſt the ſame, upon *Experience* in their own *Bodies*. Thoſe who deſire to be ſatisfied, may alſo read *Joh. Jacob Saar.* his *Itinerar. Ind. p.* 11. *Olearius*'s *Itinerar. Perſic. l.* 5. *c.* 15. *&* 18. *B. D. D. Sacks*, *Tom.* 11. *Epher. German. Obſ.* 69. *p.* 126. *Bauchin*, *p.* 450. *Cardanus*, *Scaliger*, *Nich. Monordei*, *Fogelius de Turcarum Nepenthe*, *Bellonius*, and *others*; whoſe Words I do not repeat, partly for *Modeſty*'s, partly for *Brevity*'s ſake.

It

It does (I confeſs) look like a *Riddle*, that a moſt relaxing and ſtupifying *Medicament*, which takes away much of the Senſe of *Feeling*, (and conſequently *Irritations* to *Venery*, as one would think) ſhould notwithſtanding *irritate* thereunto, cauſe *Erections*, *&c.* however, it is moſt certain, tho' a ſeeming *Contradiction*, of which ſort you have many more among the *Effects* of *Opium*.

Uſual and frequent (tho' not conſtant) Effects of Opium, *uſed internally in a moderate Doſe.*

1. *Sleep*, which is ſo far from being a *conſtant Effect* of *Opium*, that it will in me, and many other Perſons, prevent *Sleeping*, even when otherwiſe inclin'd to it.
2. *Pleaſant Dreams.*
3. *Stopping of Vomitings.*
4. *Stilling the Hiccough.*
5. *Taking off Convulſions and Contractions.*
6. *Cauſing Meat to ſtay long at Stomach.*
7. *Moderation, and prevention of Hunger.*
8. *Sweat.*
9. *The Flowing of the Menſes*, tho' not obſerved by vulgar Phyſicians.
10. *The Flowing of the Lochia*, which is as little obſerved.
11. *Voiding of the Stone.*
12. *Delivery of Women.*
13. *Deadneſs of the Eyes, as you ſee in Drunkenneſs.*
14. *Dilatation of the Pupil.*
15. *Growth of the Breaſts, Penis, and Increaſe of Milk.*
16. *Venereal Dreams.*
17. *Nocturnal Pollutions.*

18. *Itch.*

18. *Itchings in the Skin.*
19. *Much Urine.*
20. *Nauſea.*
21. *Swimmings in the Head.*
22. *Watching.*
23. *A kind of dubious State, between ſleeping and waking.*
24. *It ſtops Hemorrhages* in many caſes.

Many more *Inſtances* of this *kind* might be given of its frequent and uſual *Effects* in *Diſeaſes*; but it would be *endleſs* and *needleſs*, ſince we have mentioned the *Prime*, *General*, and *Fundamental Effects*, upon which all ſuch do depend, and that the particular *Enumeration* of its *Effects* in *Diſeaſes*, belongs to its *curative* and *paliative Virtue*, which will be handled hereafter.

The rare Effects of Opium, *taken in a moderate Doſe.*

1. *Temporary Palſies*, as of the *Bladder*, and ſometimes of other Parts, tho' very rarely.
2. *Faltring of the Tongue.*
3. *Looſneſs of the lower Jaw*, as in the *Drowſie*, *Drunkards*, &c.
4. *Prevention of Sweat*, in ſuch as ſweat too much for want of *Perſpiration.*
5. *Abortion.*
6. *Prevention of Abortion* in ſome Caſes.
7. *Intumeſcence of the Lips.*
8. *Curing of the Dropſie*, of which Dr. *Willis* gives an *Inſtance.*
9. *Curing of Stupors* of ſome *ſorts*, as thoſe from *Colds*, *&c.*
10. *Anxieties and Diſtreſſes.*
11. *Vomitings and Hiccoughs.*
12. *Convulſions.*

13. *Syn-*

13. *Syncopes, Leipothimies, and Faintings.*

14. *Death*, tho' very rarely, and that in very weak *People.*

15. *Purging.*

16. *Raising and reviving ſome Perſons that are juſt expiring.*

17. *A long ſtay thereof at Stomach ſometimes.*

18. *Stoppage of Urine.*

19. *It ſometimes proves dangerous after Hemorrhages and large Evacuations.*

1. *Note*, That the *firſt Claſs* of *Effects* being the moſt *conſtant*, are the moſt *proper*, *genuine*, and *principal Effects*, upon which all other *Effects* depend, unleſs they are *accidental*: It muſt therefore be, that theſe ſhould beſt guide us in the *Diſquiſition* of the *Cauſe of the Operation of Opium.*

2. *Note*, That the *ſecond Claſs*, tho' not ſo *conſtant*, are *natural Effects* of *Opium*, and will be alſo good *Guide* for the ſame purpoſe.

3. *Note*, That there is but little *notice* to be taken of the *rare Effects* for that purpoſe, becauſe moſt *accidental.*

The Effects of the going off (or declination) of the Operation of Opium, *taken internally in a moderate Doſe.*

1. *A general return of all the Diſeaſes and Diſaſters that* Opium *paliated during its Operation*; unleſs it happens that ſome are cured thereby; which (if they be) is generally by the *Benefit* of *Sweat*, or *inſenſible Perſpiration*; as *Colds*, *Pain* from *Wind*, or *Humours*, that ſhould have paſſed by the *Pores*; as in *Coughs*, *Tooth-ach*, &c. from Conſtruction of the *Pores*; or by *compoſing* the Fury of the *Spirits*, or *Bloud*, which it very often (yea, generally) cures with one *ſingle Doſe*: But of theſe things, more in the *Curative Part.*

2. *Sweat*,

2. *Sweat*, tho' not conſtantly.
3. *Frequent making of Water*, ſometimes.
4. *A Looſneſs (ſometimes)* even when there was none before the giving of the *Opium*.
5. *Diſeaſes, ſeeming worſe than before the taking of it.*
6. *A melancholy and ſad Depreſſion of Spirits.*
7. *A narrow Pulſe.*
8. *Itching of the Skin.*

CHAP.

CHAP. V.

The Effects of Opium *taken in an Excessive Quantity.*

1. A *Heat at Stomach.*
2. *A sense of Weight at Stomach* (sometimes.)
3. *Gaity of Humour at first.*
4. *Sardonick Laughter afterward.*
5. *Laxity, and Debility of all Parts.*
6. *Alienation of the Mind.*
7. *Loss of Memory.*
8. *Darkness of the Eyes.*
9. *Laxity of the* Cornea.
10. *Appearance of divers Colours.*
11. *Deadness of the Eyes to the View.*
12. *Faltring of the Tongue.*
13. *A Sopor.*
14. *A slow, and wide Pulse.*
15. *A high Colour.*
16. *Looseness of the Jaw, and Lips.*
17. *Intumescence of the Lips.*
18. *Difficulty of Breathing.*
19. *Fury, and Madness.*

(3–19) As after Drinking a great Quantity of Wine in a short time.

20. *Venereal Fury.*
21. *Priapisms.*
22. *Violent Itchings.*
23. *Nausea's.*
24. *Swimmings in the Head.*
25. *Vertigo's.*

26. *Vo-*

26. *Vomitings.*
27. *Hiccoughs.*
28. *A turbulent Pulſe.*
29. *Convulſions, and Cold Sweats.*
30. *Faintings and Leipothymies.*
31. *Cold Breath.*
32. *Death.*

Such as eſcape it generally have,

33. *Plentiful Purging.*
34. *Sweats that ſmell of the* Opium.
35. *Violent Itchings* in the Skin.

1. *Note*, That all theſe *Effects* do not happen to all, but ſome to one, and ſome to others.

2. That theſe *Effects* are greater, or leſs, according to the *Doſe*, *Conſtitution* of the Perſon, and other *Circumſtances.*

3. That they are moſt endanger'd thereby, that have a *Lax*, and *fine Texture*, and a weak *Digeſtion.*

4. That a *Looſeneſs* upon it is a good ſign.

5. That it affects ſome by making them Furious, (as *Wine* does) and others Stupid; Generally the Furious are moſt ſafe from *danger* of *Death*: But of theſe Things more hereafter (by *God's Help.*)

CHAP. VI.

The Effects of a long, and laviſh Uſe of Crude Opium.

1. *Relaxation, and Weakneſs of all Parts.*
2. *Inhability, or Liſtleſneſs to do any thing,* exept it be while the *Opium* Operates.
3. *Inhability, or Liſtleſneſs to get up in the Morning.*
4. *A dull, moapiſh, and heavy Diſpoſition,* (as in old *Drunkards*) *except it be during the Operation of* Opium.
5. *Diminution of Appetite.*
6. *Weakneſs of Digeſtion.*
7. *Dropſies.*
8. *Decay of Parts.*
9. *Weakneſs of Memory.*
10. *Stooping in the Back.*
11. *Early Decrepiteneſs.*
12. *Shortneſs of Life.*

} As is obſervable in old *Drunkards.*

13. *Acrimony of Blood.*
14. *Inclinations to Venery.*
15. *Frequent Inclinations to make Water.*
16. *Priapiſms, and frequent Erections.*
17. *Nocturnal Pollutions.*

The Effects of ſudden Leaving off the Uſe of Opium, *after a long, and laviſh Uſe thereof.*

1. *Great, and even intolerable Diſtreſſes, Anxieties, and Depreſſions of Spirits,* which in few *days* commonly end in a moſt miſerable *Death*, attended with *ſtrange Agonies*, unleſs Men return to the *Uſe* of *Opium*; which ſoon raiſes them again, and certainly reſtores them; if it has *time* to operate, before they die; which it ſoon does in a *liquid Form*. Or, if they have not *Opium*, or will not take it, they muſt uſe *Wine* very plentifully, and often, as a *ſubſtitute* to the *Opium*, tho' it doth not perform half as well as *Opium*.

2. *A return of all Diſeaſes, Pains, and Diſaſters, that were palliated by the taking of* Opium.

3. *Dangerous Looſeneſſes.*

4. *Death* follows the leaving it off, after a very long, and laviſh uſe thereof.

The Inconveniences of leaving off the *Uſe* of *Opium*, do bear a certain *Proportion* to the Time, and *Quantity*, that it has been uſed in.

1. *Note*, That the *Turks* do drink ſome Water always after the taking of *Opium*, as being the beſt *Menſtruum* to diſſolve it.

2. *Note*, That it is uſual with them to take a *Drachm* in the *Morning*, and ſo much in the *Afternoons*, and ſo may we, as well as they, if uſed to it; and 'tis a very ſilly ſaying, that you'll find in *Authors*, That they are better able to bear it, becauſe of the *Climate*, *&c.* whereas the more Northern Perſons are better able to take it, than the Southern, as will hereafter appear moſt plainly.

I am

I am told of one near *Banbury*, that takes Two Ounces a *Day*.

3. *Note*, That among the *Effects* of *Opium* may be obſerved many *ſeeming Contradictions*, yet is there nothing more certain than the ſeveral different *Matters* of *Fact*; which (no doubt) has been a great Cauſe to puzzle the *World* about it, and to run Men into ſtrange *Abſurdities* concerning its Operation; and all to deviate ſo far from the Truth, that nothing in *Nature* can be farther, unleſs you'll ſay, that *Heat cools*, or what *pleaſes* the *ſenſitive Soul*, is at the ſame time *abhorr'd* by it.

Now, becauſe theſe ſeeming *Contradictions* in the *Effects* of *Opium*, are the greateſt *Rubs* to be met with, and that the *Reader* may take the better Eſtimate of the *Undertaking*, and my *Explication* of its *Effects*, when I come to it, I ſhall not fear to enumerate them diſtinctly, (tho' they will make the ſtrangeſt *Catalogue* of *Riddles*, that ever was ſeen) truſting in Him, that created this wonderful *Medicament*, that he will enable me to explain all its *Effects*.

The seeming Contraditions in the Effects of Opium.

1. It *causes Sleeping*, and *Watching*.
2. It *causes*, and *prevents Sweat*.
3. It *relaxes*, and *stops Loosenesses*.
4. It *stops Flowes*, and *causes* that of *Sweat*, *&c.*
5. It *stupifies the Sense of Feeling*, yet *irritates by that Sense to Venery*.
6. It *causes Stupidity*, and *Promptitude* in Businesse; *Cloudinesse*, and *Serenity* of Mind.
7. It *excites* the Spirits, and *quiets* them.
8. It is *very hot*, yet *cools* in Fevers.
9. It is *hot*, and *bitter*; yet *lessens Appetite*, even in Cold *Stomachs*.
10. It *stops*, and *promotes* Urine.
11. It *relaxes*, and *weakens*; yet enables us to *undergo Labours*, *Journeys*, &c.
12. It *causes*, and *prevents* Abortions.
13. It *stops Vomiting* above all things; yet *causes most violent*, *tedious*, and *dangerous Vomitings*.
14. It *stops Purging* in a most eminent manner; yet *sometimes causes it*.
15. It is *very acrimonious*, yet (as all say) *obtunds Acrimony*; however, it allays Pain proceeding from *Acrimony*.
16. It *causes* a *furious Madnesse*; yet *composes the Spirits above all things*.
17. It *causes Dr[illegible]s*; yet sometimes *cures* them (as *Willis* says.)
18. It *causes Palsies*; yet have I known it to *cure a Palsie*.
19. It *causes Drinesse in the Mouth*; yet *takes off* Thirst in *Fevers*.
20. It *cures*, and *causes* a Hiccough.

21 It

21. It *ſtanches Blood*; yet cauſes the *Blood to come outward*, (as appears by the *Efflorescence*, or *Redneſs* of the Skin that it cauſes) yet *moves* the *Menſes* and *Lochia*.

22. We have many Inſtances of it *promoting*, and *hindering* Critical Motions.

23. It *raiſes very weak People*, (when nothing beſides will do it) yet it *kills* other *weak People*.

24. It *cauſes*, and *cures* Convulſions.

25. It *cauſes Relaxation, and Contraction* of the *ſame Parts*.

26. It *Relaxes*; *yet cauſes Rigidity, Tenſion, and Erection of the Penis, Priapiſms*, &c.

Thus have I fairly, and faithfully, laid the whole *Onus* of the *Operations*, *Effects*, and *Contradictory Phenomena's of Opium*, upon my *Shoulders*; however I come off, and clear my ſelf of the *Intricacy*, *Mazes*, and *croſs Effects* thereof, by explaining them; which none upon the View thereof will think poſſible, and none before me durſt as much as enumerate for that *End*.

CHAP. VII.

The Author *contrives a Compendious Way of Examining all Opinions concerning the Operation of* Opium.

HAving, without any *sly* or *sordid Evasion*, or considerable *Omission*, (which has been the perfidious Course of *Authors* in this Case) fully and truly enumerated the *sensible* and *certain Effects of Opium* in Humane Bodies, and thereby *empannel'd* a *Just Jury* for the *Trial* of *Hypotheses*, which must be Judged by the *Effects* or *Phenomena's* of *Opium*; I will now proceed to their *Examination*. But because it would be endless to take every one *particularly* into *Consideration*, I will use their *Stratagem*, who *blow up Foundations*, to save the tedious Pecking at all the Parts of the *Superstructures*, which in this Case would require an *Age*, and take up all my Time in *demolishing* them, which may be better employ'd in *erecting* something that may be useful.

I have *considered*, and find, That the *Foundation*, in which all *Authors*, both *Ancient* and *Modern*, agree, and whereupon they have hitherto endeavour'd to build, (looking upon it as *firm* and *Warrantable* in all *Ages*) is this, *viz.*

That Opium *operates by diminishing or disabling the Spirits* (meaning the *animal Spirits.*)

The Ancients *affirming*, *That it did so by an extreme cold Quality*, *&c.* And

The

The Moderns (who obſerved it to act, while it is at *Stomach*, by affecting the *Brain*, *Nerves*, *Animal Spirits*, *&c.* and concluded no Action was perform'd without Contact) *infer'd* and agreed, (becauſe no viſible Paſſage could be found from the *Stomach* to the *Head*) *that it muſt of abſolute neceſſity act by Fumes, Vapours, Auras, or Effluviums ſent up out of the Stomach to the Brain, Nerves, &c.*

So that all the remaining *Queſtion* among the *Moderns* is, Which *Way* thoſe *Fumes* or *Vapours* do the *Feat?* all allowing the *Fumes* do it.

One ſaying, That they *ſtuff the Pores of the Brain*, and ſo hinder the *Generation* of *Animal Spirits.*

A *Second*, That they *conſtringed, and cloſed the Pores together*, thereby hindering the ſaid *Generation.*

A *Third*, That they *fix'd, and coagulated the Animal Spirits*; as *Wedelius*, and others.

A *Fourth*, That they *clouded the Animal Spirits.*

A *Fifth*, That they *acted as a Poiſon*; as *Willis*, and many others.

A *Sixth*, That they *clog'd the Animal Spirits, by adhering to them*, &c.

Not knowing, nor (I think) caring what they ſaid, ſo they humour'd their own *Imaginations*, and *Hypotheſes*; tho' utterly incapable of ſolving the *Effects* of *Opium*, eſpecially its moſt *conſtant*, *proper*, and *genuine Effects.* For, how can a *cold Quality*, (which *Opium* never had) cauſe a *gay* and *brisk Humour*, *Bravery*, *Magnanimity*, *Euphory in Labour*, *Promptitude to Venus*, *&c.* And, how can *Clouds of Vapours* hinder the *Generation* of *Animal Spirits*, by *ſtuffing* or *conſtringing* the *Pores* of the *Brain? Poiſoning*, *fixing*, *coagulating*, *clogging* or

clouding the Animal Spirits, cauſe a fine *Ovation* thereof, a *Gay*, *Brave*, *Couragious*, *and Magnanimous Diſpoſition*, *Euphory*, *Promptitude to Venery*, *Serenity*, *Expediteneſs in Management*, *&c.* Which are (as has been ſaid) the *conſtant* and *proper Effects* of *Opium*.

Nor, indeed, was any of thoſe *Authors* ſo foolhardy as to attempt it; Why then did they write, and trouble the *World* to peruſe their *Books*, when they were ſo far from explaining the *Properties* of *Opium*, that they ſcarce ever durſt mention them, nor ſet their *Hypotheſiſes*, and them, as much as in View of one another? Was not this a *tacit Confeſſion* of the *Incompetency* of their *Suppoſitions*? I beg Pardon for calling them theirs, (tho' they themſelves do) for I cannot offer them a greater *Abuſe*, than laying their *Spurious* and *lame Brats* at their *Doors*.

Tho' one ſcarce need ſay any more of them, yet, leſt I be thought preſumptuous, or ſaucy, for ſo much as offering to *ſuſpect* the *general Foundation* of all the *famous Authors* that ever lived, (as *Galen*, *Avicenna*, *&c.* among the *Ancients*; *Etmuller*, *Willis*, *&c.* among the *Moderns*;)

1. *I will ſhew you very juſt Cauſes to ſuſpect the Inſufficiency of the* general Foundation, *viz.*

That *Opium* diminiſhes or diſables the Spirits.

2. *I will prove, That it does not do it by a* Cold *Quality.*

3. *That it does not do it by Vapours, Fumes, Aura, or any ſuch Way.*

4. *That it diminiſhes, or diſables the* Spirits, *by no Means whatſoever.*

Which

Which *diminishing, or disabling of the Spirits, Cold Quality,* and *Fumes,* (or *Aura*) comprehend the *Foundations* of all *Opinions* concerning *Opium,* that ever I read, or heard of; and consequently if those Two *Fundamental Opinions* be refuted, all the Superstructures that have been (in this Case) must fall to the Ground.

CHAP. VIII.

The Author *ſhews Juſt Cauſes of his Suſpicion, that all Authors have gone upon a wrong Foundation in their Diſquiſitions of the Cauſe of the Operation of* Opium.

I Have ſhewn you, That the *general Foundation* of both *Ancient*, and *Modern* Authors, is,

That Opium *doth diminiſh, or diſable the* Spirits.

And now I will plainly ſhew *Juſt Cauſes of my Suſpicion* of its *Inſufficiency*, which are theſe:

1. I *obſerve*, That all Learned Men are, to this *day*, highly diſſatisfied as to the Cauſe, and Manner of the *Operation* of *Opium*, notwithſtanding all that has been written concerning it; and that it is the *common Cry* on all Hands, that none has illuſtrated the *Operations* of *Opium* to any *Purpoſe*, or given any Satisfaction therein; and therefore *Learned Phyſicians* are ſtill as much upon the *Enquiry*, as ever they were.

It is much more *Civil* and *Reaſonable*, to *ſuſpect* the *Foundation*, that all former *Authors* have built upon, than a *general Failure* in all the moſt Judicious *Maſter-Builders*, that ever endeavour'd to build thereon; for if all the beſt *Architects* of the *whole World* fail to erect a firm *Superſtructure* upon any one *Foundation*, what can we think, but that the *Foundation* is infirm? eſpecially when (as in our Caſe) no *Way* (that *Care*, *Judgment*, *Perſpicacity*, and *Wit* could invent, or think of) has been

been left untried to build thereon; ſo that (tho' I modeſtly call it a Cauſe of *Suſpicion*) it amounts almoſt (if not altogether) to a *Demonſtration*, that the *Foundation* that all *Authors* have gone upon is naught. Would not any conſidering Man, when he ſees all the *Judicious Architects* of the *World* fail to erect a firm *Building* upon a *certain Foundation*, ſeek for another? Therefore who can blame me, if I do? and not blame them, that did not? The meaneſt *Bricklayer*, or *Carpenter*, that ſhould be guilty of ſuch *Stupidity*, as to attempt to build upon ſuch a Foundation as always deceiv'd the *Builders*, would be thought too great a *Blockhead* to be employ'd in Building.

2. I *obſerved*, That moſt Men do (notwithſtanding that *Foundation* is agreed upon) think it impoſſible to explain the intricate, various, contradictory *Phenomena's*, and myſterious *Effects* of *Opium*; fitting contented, and perſwaded, that it operates by an *occult Quality*, wholly unexplicable, and particularly reſerved from the *Knowledge* of *Mankind*: But Nature works *Mechanically* in *Weight*, *Meaſure*, *&c.* Therefore it is more than probable, that it is only their being upon a wrong Bottom makes it ſeem abſolutely *occult*; for it is impoſſible to find a thing, where it is not; or to build firmly upon an *inſufficient Foundation*; whereas had it been right, and true, it is not to be imagined, but ſome or other would have thereupon done ſomething, that would have ſtood againſt all *Winds*, and *Storms*; which none have done.

3. I *obſerved*, That none durſt venture to lay the *whole*, nor nor one *half* of the Burthen of the *Phenomena's*, or *Effects* of *Opium*, upon that *Foundation*; foreſeeing (doubtleſs) that it could not bear them, and that if they laid any more *Weight* thereon, the whole would totter, and fall to the *Ground*. The *Project* in every *Hypotheſis* is to perſwade

swade Men of the *Truth* thereof; and the only *way* to do it, is to solve all *Phenomena's* thereby; for if it fails but in one, it is an infallible sign of its *Insufficiency*: There was no Reason to omit any of the *Phenomena's*, if they could have discern'd, that the *Hypothesis* would have born them; therefore (as has been intimated) it implies a Confession of its *Incompetency*.

4. I *observed*, That *ancient Authors* writ of *Opium*, before it came to be of common and general Use in the *Day-time* with Healthy Persons, (as it since is in many *Nations*) to cause a *gay*, *pleasant*, and *good Humour*, *take off Sadness*, *Melancholy*, and *Anxiety*; To *cause Assurance*, *Boldness*, *Courage*, *Bravery*, *Magnanimity*, *Euphory*, or *ease undergoing* of *Labour*, *Journeys*; *Promptitude in Business*, *Expediteness*, and *Severity*; To *excite to Venery*, &c. Which Effects cannot be explained by that *Supposition of disabling the Spirits*, and that they used *Opium* only Medicinally for the sake of such other *Effects* as might be tollerably well explicated by that *Hypothesis*; so that they had not any *Occasion*, nor *Inducement* to look any farther.

The *Effects* they gave it for was only; 1. *To cause Sleep*. 2. *To take off Pain*. 3. *To stop Fluxes*. 4. *To Compose the Spirits*. 5. *To cause Perspiration*, *and Sweat*. All which are not inconsistent with the *Hypothesis* of *diminishing or disabling the Spirits*, as the *other* are, and therefore might well deceive them; For,

First, *Sleep* is caused by *diminishing the Spirits by Labour*, *Watching*, &c. as is most notorious over the *whole World*; so other Things that diminish the Spirits, as *Bleeding*, *Vomiting*, *Purging*, and many other Causes of *diminishing* thereof, do incline us to *Sleep*.

Secondly,

Secondly, *Indolence*, or *Exemption from Pain*, is caused by nothing more than *want of Spirits*, as in *Paralytical Cases*, *Stupors*, *Obstructions*, or *Compressions* of the *Nerves*, *Syncopes*, *Leipothymies*, *Deliquiums*, *Faintings* after *Bleeding*, and *Sleep*; which (as was said) is so much caused by *loss* of *Spirits*, *&c.*

Thirdly, *Fluxes are stops*, *or moderated*, by nothing better than *Sleep*, which generally (as was said) proceeds from *loss of Spirits*; What also *stops*, or *moderates Fluxes*, more than want of the Sense of the Irritation of *Humours*? And what takes away Sense more than want of Spirits? Thus want of Sense by the absence of the Spirits, in *Paralytical Intestines*, stops *Fluxes*; Thus fails a *Paralytical Bladder* to express the *Urine*. So a *Palsie* of the *Membranes*, that include the Glandules, must (as in *Sleep*, which relaxes them) stop, or moderate all *Defluxions*, *Catarrhs*, *&c.* because they are not sensible of the *Irritation* of the *Humour* by Quantity, or Quality; which *Irritation* causes the *Defluxions* or *Catarrhs*, by exciting the *Membranes*, to contract, and thereby to squeeze out the *Humours* contain'd in the *Glandules*.

Fourthly, *The Composure of the Spirits* is procured mainly by *Sleep*, which all loss of Spirits (as was shewn) inclines us to; so *Bleeding*, which *diminishes the Spirits*, compose their Fury in *Fevers*, *Deliriums*, *Madness*, *&c.*

Fifthly, *Perspiration* is caused by nothing more than *Sleep*; for we perspire twice as much in *Sleep*, as when we watch, as is most manifestly demonstrable by the *Statick Experiments* of Weighing People; nor is *Perspiration* ever so great as in *Deliquiums*, *Syncopes*, *Leipothymies*, and such like deadish Cases, which are caused by *diminishing*, *or disabling of the Spirits*, nay, 'tis so in *Animals*,

Animals, quite dead for a little time while they are hot, as is evident by like *Statick Demonſtrations*: The true Cauſe of which is *Relaxation* of the *Pores*, *Skin*, *&c.* for want of Spirits to *contract*, and *conſtringe* them; as ſhall be fully proved hereafter (by *God's Help.*)

Theſe Things were (doubtleſs) the occaſion of that *Hypotheſis*, of *diminiſhing or diſabling the Spirits by Opium*; but how likely are they to err by eſtabliſhing it without any conſideration of its *enlivening*, *encouraging*, and *brisk Effects*, as *Ovation of the Spirits*, *Gaity*, *Bravery*, *Magnanimity*, *Euphory*, *Promptitude to Venery*, *&c.* which can never be ſolved by *Diminution*, *or Diſability of the Spirits*, till *Depreſſion* and *Elevation* thereof are *reconcilable*, and *conſiſtent* at the *ſame time* in the *ſame ſubject*; which can never be till *Diſabling* and *Not Diſabling* are the ſame thing? Have not we then *good Reaſon* to ſuſpect that *general Foundation* of *diminiſhing or diſabling the Spirits by Opium*, which was laid by ſuch as never conſidered any thing of its *generous* and *ſprightly Effects*, which (as has been ſhewn) are its *conſtant*, and therefore moſt *proper* and *genuine Effects?* Who can doubt then but they muſt err, in laying a *Foundation* quite contrary to the very *Properties* of *Opium?*

5. I *obſerved*, That all our *Modern Authors*, and *Phyſicians*, receiving the Knowledge of *Opium*, its *Effects*, and *Uſes*, from thoſe *Ancients*, do uſe it only for the ſame *Ends* and *Purpoſes* as they did; and that our *Modern Authors*, living in theſe *Weſtern Parts* of the World, very remote from the *Eaſtern Countreys*, where it is uſed commonly, and in large Doſes, by People in *Health*, in the *day-time*, to *enliven*, *invigorate*, and *encourage* them, and cauſe the *brave*, *generous*, *and magnanimous*

Effects

Effects aforementioned, *viz. Courage, Euphory, &c.* and finding no *Phyſician* that went before them, to mention theſe *noble, cordial,* and *glorious Effects*; and, if they did at any time ſlightly touch them, to do it with all imaginable *Diſregard, Neglect,* and *Contempt*, as if there was no Heed to be taken of them, but as *idle Tales,* and *improbable Stories,* being contrary, and utterly (as they thought) inconſiſtent and irreconcilable with the *daily,* and moſt *notorious Effects of Opium,* obſerved among us; and to the Univerſal Opinion of all *Authors,* who ſtated *Opium* to be a *Diminiſher or Diſabler of the Spirits,* which could not produce (as they concluded) ſuch *contradictory,* and therefore (to them) utterly *incredible Effects,* and *fabulous Flams,* ariſing (as they fanſied) from ſome ſilly *Errours,* as want of due Obſervation in *Travellers,* miſtaken Diſcourſes, and the like; ſo that (as the ſaying is) they let them in at one *Ear,* and out at the *other,* there being no ſuch contrary *Effects* of any one Thing to be obſerved in the whole *Creation*; and they being well aſſured of the other *Effects* by daily *Experience,* and having never obſerved thoſe *lively Effects,* (for the ſeveral plain Reaſons that you'll meet in the following Paragraphs) had no cauſe to alter their *Opinion,* when all Things ſeem'd to them to make for their *Hypotheſis,* for want of a Notion of thoſe *brisk Effects.*

6. I *obſerved,* That thoſe *brisk Effects* of *Opium* were not taken notice of by our *Phyſicians,* nor indeed, (all things conſidered) do I well ſee how they ſhould, without getting out of the common *Road* of obſerving, which is ſometimes (as I have found) very uſeful upon ſuch Occaſions. For,

Firſt, *Opium* is ſeldom (if ever) given in theſe *Weſtern Nations,* but to Sick People, (as the *Ancients* did) who are utterly incapable of thoſe *brisk*

brisk Effects, or (at least) to any remarkable *degree*, that might call for a particular or special *Advertency*, or *Attention*; without which, they passed off as they came, without any *Reflection* thereupon; and so signified nothing, as if they had never happen'd.

Secondly, We (as the *Ancients* did) generally give *Opium* when People are going to *Bed*, by which means all Opportunity of *Observation* is lost; because *darkness*, and being alone, hide, or hinder the shewing of any such *Effects*; and the *Physician* (whose only Business it is to be more curious in such Matters) is gone to his own *Rest*, tho', if he were present, not likely to take any *Observations* of such Matters, whereof he has least *Thoughts*, or *Belief*, as being, in his *Opinion*, contrary to all *Reason*, *Sense*, *Experience*, and the *Opinion* of all *Authors*, of the Sempiternative Quality of *Opium*, in which they all agree.

Thirdly, *Opium* is (as was said) given in these Countreys to cause *Sleep*, or such *Effects* to which *Sleep* conduces, as *composing the Spirits*, *causing Indolence*, *stopping Fluxes*, and *promoting Perspiration*; and therefore always given with all careful *Directions*, and *Injunctions*, that may conduce to that *End*, as *going to Bed*, *lying still*, *putting out Lights*, *keeping Silence*, *&c.* which concurring with the *Opium*, cause *Sleep*, which is utterly inconsistent with shewing any of those lively *Effects*, that belong only to a *waking Person* to do; so that all Opportunity of Observation is utterly precluded.

Now, (all the Premises considered) it cannot be conceiv'd, that such as set their mind upon *contrary Effects*, and expect no other, much less contrary ones, (against which also they are highly prejudiced by their *Reason*, *Experience*, and *Reading*)

ing) should observe such *brisk Effects*, if they did happen; and how can a *brisk Humour, Courage, easie undergoing* of *Labour, Promptitude to Venus, &c.* be observed in Sick, and Infirm *People*, lying in Bed, alone, and in the *dark*, or (which renders it utterly impossible) while they are asleep, and the Thing it self disbelieved, and esteem'd contrary to *Common Sense*, and the *Universal Sentiment* of the Learned, and all others. Therefore,

7. If (after all) any such *brisk Effect* did ever happen, it must be either not regarded, or if observed, (which is no *way* likely, as was shewn) you may be sure (for the many plain *Reasons*, and Causes aforesaid) that it was not imputed to *Stupifying Opium*, (as all esteem it) but to any other *Cause*, or Accident, rather than to a Thing well known to have quite *contrary Effects*. For *Instance*:

If the Sick Person happen'd to be *good humour'd*, (of which he is seldom capable, and utterly incapable of all or most of the other brisk *Effects*, as *Euphory, Promptitude to Venus, Exertion of Courage, &c.*) it was either passed by as an ordinary Thing of Course, and so not heeded, or else imputed to *Refreshment* by *Sleep*, *Ease* from Pain, or some *Amendment* as to the Disease; or, indeed, to any Thing, rather than *Dispiriting* and *Stupifying Opium*, that is so far (in all Opinion) from exciting the Spirits, that all affirm, conclude, and agree, that it *diminishes or disables them.*

The like is to be said of any of the *lively Effects*, in case they happen, and are observ'd; Tho' I do not see how they can, so (at least) as any *Stander by* will refer it to *Opium*; besides, that as to some of the *brisk Effects*, (especially that of *Venery*)

Venery) greater *Doſes* are requiſite, to render it any thing remarkable, than are uſed in theſe *Weſtern Parts*, and that *Modeſty* would much hinder the *diſcovery* of this *Effect*.

Is it not *therefore* very manifeſt, that I had great cauſe to ſuſpect, that both *Ancient* and *Modern Phyſicians* conſider'd things by *halves*, ſince they did not take the moſt *genuine Properties* into their Conſideration, and that they laid their *Foundation* upon the moſt *contrary Effects* to them? It follows then, That the *general Suppoſition* of all the Learned can no more ſolve the true *Properties of Opium* in any Probability, than giving the Reaſon why Fire *hardens Clay* can explain why it *ſoftens Wax*; The *Reaſon*, did I ſay! I ſhould have ſaid, than giving the *wrong Reaſon* why it *hardens Clay*, ſhews how it *ſoftens Wax*; for it will appear in the following *Chapters*, that they gave no *right Reaſon* for any *Effect* of *Opium*, even thoſe they ever allow'd to be its *Effects*; nor laid any *true Foundation* to explain the leaſt, meaneſt and plaineſt *Effect* thereof; foraſmuch as all their *Suppoſitions* are ſo falſe, that there never were any ſuch *Things* as they lay down to explain the Effects of *Opium*, viz.

1. *No ſuch Thing* as *a Cold Quality in* Opium.
2. *No ſuch Things* as *Fumes*, &c. *flying from* Opium to the *Brain*, while it is at Stomach.
3. *No ſuch Thing* as *diminiſhing*, or *diſabling the Animal Spirits* by *Opium*, any way whatſoever. Of which in their Order in the following *Chapters*.

CHAP.

CHAP. IX.

It is proved, That Opium *has no Cold Quality to diminish or disable the Spirits thereby.*

HAving shewn just Causes of my *Suspicion* of that Universal *Foundation* of *Opium*'s *Diminishing or Disabling the Spirits*, I will now proceed to a more strict *Examination* thereof, beginning with the *Opinion* of the *Ancients*, who affirm'd,

That Opium *diminished or disabled the Spirits by an extream Cold Quality.*

I confess that much may be done towards the *diminishing, or disabling the Spirits by Opium*, if it had such a *cold Quality* as the *Ancients* attributed to it; for then it must be such a *Coldness*, as the coldest Things either *actual*, or *potential*, bore no *Proportion* to; for *Ice*, *Snow*, *&c.* bear no Proportion to it, in causing the same Effects by a *cold Quality*.

It was the manner of the *Ancients* implicitly to believe, and subscribe to what their great *Authors*, and *Masters* in *Physick*, or *Philosophy*, taught them; whom they adored as infallible *Gods*, as soon as their *Mortality* proved the contrary; which was as absurd, as asserting, That *Opium*, which is one of the hottest Things that Vegetables afford, is *extream cold*; (blessed be *God* for our *Light* in *Religion*, and *Liberty* in *Philosophy!*) Therefore some such admir'd *Authors*, or *great Masters* in *Physick*, having asserted, that *Opium* acted by an

extream cold Quality, all did implicitly ſubſcribe to it.

The *Devil*, whom they worſhip'd, could not (tho' *a Deceiver from the Beginning*) impoſe more upon their *Faith*, than in cauſing them (for I cannot think but it was ſome ſuch *Evil Power*) to believe, that *Opium* was *cold*, againſt all the *Evidence* of *Senſe* and *Experience*; he might have as well told them, that *Hell Fire* had all the *Properties* of common *culinary Fire*, and yet nothing more refreſhing by its *cold Quality*; for as many of our *Senſes*, as can take notice of *Heat* and *Cold*, do plainly inform us, that it is very hot in it ſelf, and *Effects*. For,

1. Its *Taſte* is very *bitter*, *rank*, *vehemently hot*, *burning* and *biting*, all which *Qualities* are infallible Signs of great *Heat*, and the better the *Opium* is the more intenſe are thoſe *Qualities*; Nay, it is obſerved, that its very *Virtue* is ſtrictly combined to, or conſiſting in thoſe *Qualities*, eſpecially *Bitterneſs*, which if loſt, the *Virtue* is gone, as is commonly *obſerved*, and eaſily *obſervable*.

It was a wiſe Fetch of *Amatus Luſitanus*, in Defence of its *Cold Quality*, to attribute all its *Bitterneſs* to *Glaucium*, that was mixt therewith; whereas *Glaucium* always gives a *yellow Tincture* to *Water*, and *Opium* a red; but the *Opium*, that gave no *yellow Tincture*, was bitter alſo; yea, that was moſt *bitter*, that gave the *reddeſt Tincture*; How comes *Theban Opium*, and indeed all other *Opium*, to be bitter before any thing is mixt with it? How inadvertently abſurd People will be to defend *Abſurdities*; it is pretty to ſee how they will expoſe themſelves to defend a falſe *Opinion*.

2. Its

2. Its *Smell*, which is very *rank*, *ſtrong*, *hot*, and ſuch, as Things highly impregnated with *Volatile Salt*, and *Sulphur*, (the Two hotteſt Principles in Nature) do afford. It is from *Volatile Salt* that *Cantharides*, *Piſmire*, *Spear-Wort*, *Crows-foot*, *&c.* are ſo very hot, as to bliſter, (or exulcerate;) and are not all *hot Spirits* ſuch, upon the account of their *Sulphur*? as *Spirits of Wine*, *Brandy*, *&c.*

3. The beſt and ſtrongeſt *Opium* will alſo *exulcerate*, (as all *Authors* agree) which only *Fire*, or ſuch Things, as have the Particles of *Fire* lodged in them, as *Lixiviates*, *&c.* or the hotteſt Things in *Nature*, will do; as *Cantharides*, *Spear-Wort*, *&c.* It is,

4. For the like Reaſon, a *Piſlothrick*, or *Cauſer of Hair to fall*; which only *Lime*, *Orpiment*, and the hotteſt Things, do cauſe.

5. It is *inflammable*, which only *Sulphureous* Things are.

6. It cauſes a Senſe of a *vehement Heat* at *Stomach*, tho' taken but in the Quantity of a *Drachm*.

7. It *cauſes Drineſs* of the *Mouth*, and *Thirſt*, tho' taken but in the Quantity of 3 *Grains*, which nothing does but hot Things.

8. It *diſcuſſes*; and all Diſcuſſers are *hot*, for it is by *Heat* that they do *diſcuſs*, as *Spirit of Wine*, *Cummin-Seed*, *Volatile Salts*, and all *Hot Spirits*.

9. It *ſoon Operates*, and in a *ſmall quantity*, which is an infallible Proof of the Activity of its Parts, which argues *Heat*, not *Cold*.

10. It *cauſes a gay*, *pleaſant*, *and merry Humour*, which only Wine, and hot Liquors, *&c.* do; and one *Grain* of *Opium* will cauſe them as much as ſeveral *Glaſſes* of *Wine*, which argues, that its *Heat* is much greater.

11. I would fain know *how*, or ſee any *Inſtance* of any *Cold Things raiſing the Spirits, cauſing Courage, Magnanimity, enabling People to Labour, Journey, &c.* as *Wine, hot Liquors*, and *Opium* do.

12. *Opium* does very much *open the Pores*, and cauſe *Perſpiration, &c.* which only *Heat*, as that in *Baths, Bagnios, Hot Houſes*, and *Hot Things* do; but Cold ſhuts the *Pores*, as all know. Therefore,

13. *Opium cures, and prevents Colds*; which is another Argument of its *Heat*.

14. It is a great *Aphrodiſiack*, or *Exciter to Venery*, which *Cold Things* chill; but Hot Things, as *Cantharides, Bees, Piſmires, Onions, Garlick, Leeks, Rocket, Squills, Horſe Radiſh, Sem. Human. &c.* do promote.

15. Nothing *cauſes Indolence*, given internally, but *Wine, Hot Liquors, &c.* (as I can think of) and *Opium* cauſes it much after the ſame manner as Wine does, firſt cauſing *Mirth*, and *Follity*, and, upon increaſe of *Quantity*, very conſiderable *Indolence*. It is true, that *Cold* will externally cauſe a *Stupor*, if it be intenſe, ſo as to conſtringe the Parts, and exclude the *Spirits*; but otherwiſe it makes the *Feeling* more nice, as all know by *Experience*, becauſe every little Hurt affects us more when we are cold than hot: But this is not the *Caſe* of relaxing *Opium*, which is uſed internally to take away *Pain*, as *Wine, &c.*

16. Nothing takes away the *Effects* of *Opium* (or *Drunkeneſs*) better than cold Things *internally*, and *externally*; as *acids, dipping* in *Cold Water, &c.*

17. *Opium relaxes all Parts*, which *Heat* does; and *Cold conſtringes*, as was intimated.

18. *Wedelius* confeſſes, (tho' it makes againſt what he ſays) that he never obſerved a *Soporoſe Diſtem-*

Diſtemper, where there was not a *Preternatural Heat*. *Opiolog. Lib.* 1. *Sect.* 1. *Cap.* 12. *P.* 46.

19. If it cauſes *Sleep* by its *cold Quality*, then all Things, that are *cold*, would do it proportionably; *Cucumers*, *Purſlane*, *&c.* would be ſo great *Hypnoticks*, that we ſhould not be able to eat a *Drachm* of them, but that they would cauſe a *great Sopor*; but there is no ſuch thing; and *hot Things* are much more apt to cauſe *Sleep*, or a *Sopor*, as *Wine*, *hot Spirits*, *Onions*, *Garlick*, and ſuch like.

20. *Opium* cauſes a *Redneſs*, or *Efflorescence of the Skin*, making it ſenſibly warmer, as *Heat*, *Wine*, and Strong Liquors do.

21. It cauſes alſo an *Itching of the Skin*, which only hot Things do.

22. Half a *Drachm* of *Opium* in Clyſters has cauſed a violent *Heat* in the *Guts*.

23. It *ſtops Diarrheas*, or *Looſeneſſes*, which Cold cauſes.

24. It *ſtops Defluxions*, *Coughs*, *&c.* which Cold cauſes.

25. To pin up all, its *predominant Principles* appear, by *Autopſie* upon its *Chymical Analyſis*, to be *Volatile Salt* and *Sulphur*.

Beſides, this *Opinion* of the *Coldneſs of Opium* is very much exploded, and, indeed, it is ſo apparently *falſe*, and *abſurd*, that I ſhould not have thought it worth while to argue againſt it, but that it lay ſo in my *way*, that regularly I could not well avoid it, without *Breach* of *Order* and *Method*.

I might have added, that it *reſolves*, *attenuates*, *&c.* but it is needleſs to ſay any more.

It is very *falſe*, and *erroneous*, that it *ſtops Fluxes* by *incraſſating*, and *binding*, which are accounted *cold Qualities*; if ſo, how ſhould it ſtop them when Pounds of *Incraſſatives* and *Binders* have failed, tho' the *Opium* was given only in the *Quantity* of a *Grain* or *Two*? How ſhould it ſtop, or moderate *Fluxes*, even while it is yet at Stomach, as it moſt certainly does? It bears (as *Etmuller* well obſerves) no Proportion to the *Bloud*, and Humours, to have any *Effect* that may be remarkable upon them, for a Grain is but as 1 to 115200 to the Blood of him that has 20 Pound of Blood, which an ordinary Man has: Beſides, How can *Attenuatives*, *Reſolvers*, and *Diſcuſſers*, incraſſate or bind? But, more eſpecially, How can ſo great a *Relaxer* of Parts, be a Conſtringer thereof? That is *perfect Contradiction*: And how can a meer *Sal Volatile Oleoſum*, in which all its *Vertue* lies, (as will plainly appear) thicken and bind?

The *Truth* is, that it *ſtops Fluxes* (as Sleep doth) by taking away the ſenſe of the *Irritation* of *Humours*, which ſolicite the Parts to contract, and ſo to extrude and ſqueeſe them out; it *promotes Perſpiration* by relaxing the *Pores* (as *Sleep* doth;) it alſo ſeems to thicken *Rheum*, (as *Sleep* doth) becauſe it cauſing *Sleep*, or (at leaſt) taking away a ſenſe of the Irritation of the *Rheum*, is thereby ſuffered to ſtay till it thickens by the *Heat* of the Body; the *Irritation* alſo at *Windpipe* being leſs, becauſe the *Flux* of the *Rheum* is moderated for the *Reaſon* aforeſaid. But of theſe Things more fully when we come to explain the *Cauſe* or *Cauſes* of the *Effects* of *Opium*.

CHAP.

CHAP. X.

It is proved, That Opium *ſends no Fumes, &c. from the Stomach to the Head, Brain, &c. and therefore that it does not diminiſh, or diſable the Spirits, &c. by that means.*

THO' the *Opinion* of the *Cold* of *Opium* is much exploded, that of *Fumes*, *Vapours*, or *Aura's*, ariſing from the *Opium* at Stomach, and mounting up to the Brain, *&c.* is as much received and embraced; I know none, but ſuch as think it abſolutely neceſſary, conſidering that it is moſt certain, and allow'd by all obſerving Men, That *Opium* produces all, or moſt of its *Effects*, while it is at *Stomach*; That the *Genus Nervoſum* is moſtly concerned in its Operation; and that (as was ſaid) there is no *Operation*, or *Action*, *but by Contact*: So that the *Moderns*, acquieſcing in the Neceſſity of its operating that *way*, becauſe they could conceive no other, (which is no Proof, but a *Defect* of their *Conception*) look upon it as invincible and uncontrolable *Evidence* of its operating by *Detachments* of *Fumes*, or *Effluvia's*, ſent up to the *Brain* from the *Stomach*; which appear'd ſo undeniably *concluſive*, that neither the *want* of a *ſenſible Paſſage*, nor any other *Inconvenience*, ſignified any thing (*with them*) to the contrary; therefore it became an eſtabliſhed *Foundation* by common Conſent; only they differ'd (as was ſhewn) in the manner how thoſe *Fumes* produced the *Effects* of *Opium*: And well they might, ſeeing there is no ſuch thing, nor poſſibility (if they

were) of ever explicating the various *Effects* of *Opium* by that means, as will manifeſtly appear.

I confeſs, that if *Opium* operated by ſuch *Fumes* paſſing from the *Stomach* to the *Brain*, *&c.* it would be eaſie to conceive how it ſhould *diminiſh*, or *diſable*, nay, utterly ruine the *animal Spirits*; and indeed impoſſible rationally to conceive how they could do otherwiſe: But then the *enlivening*, *invigorating*, and *encouraging Effects* of *Opium*, which are its *conſtant* and moſt *genuine Off-ſpring*, would lie upon our *hands*, without any poſſibility of giving an account thereof; for certainly dull, heavy, unnatural, undigeſted, and cloudy *Fumes*, or *Vapours*, could not advantage the *animal Spirits*, cauſe a *Triumph*, or *Ovation*, thereof, at their *acceſs*, *Courage*, *Serenity*, *Promptitude*, *Magnanimity*, *Euphory*, *Inclination to Venery*, *&c.* which we are moſt obliged to regard, as being its moſt *natural* and *proper Effects*.

This *Opinion* of the *Moderns* does preſume, or ſuppoſe, (for they prove nothing)

Firſt, *That Fumes, or Vapours, do readily and freely paſs from the Stomach to the Brain*, becauſe the groſs *Fumes* (as they call them) of a *Grain* or two of *Opium*, always operate before it is out of the *Stomach*.

But they never ſaw ſuch *Fumes* paſs, nor their *Paſſage*, only *ſuppoſe* both; and that meerly upon an *Imagination* that it muſt be ſo, becauſe they (*forſooth*) cannot conceive any other *way* by which *Opium* can affect the *Head*, *Nerves*, *&c.* while it is at *Stomach*; whereas I can, and ſhall (*God willing*) ſhew them another means, or *way*, to do it, that is *ſenſible*, and not wholly *precarious*, as theirs is, and that in the meaneſt manner; becauſe all their *Grounds* to ſuppoſe it, is their *Inability* to *conceive*,

ceive, or *apprehend*, what is (as I shall shew) very *sensible*, nay *obvious* also.

Secondly, *They suppose, That such Fumes will serve to solve all the Phænomena's and Operations of Opium*; whereas it is utterly impossible they should solve the *enlivening* and *invigorating Effects* thereof, (as has been shewn, and shall be further proved, if God permits.)

It were easie to evidence, but that it would be tedious and needless, (for their Incompetency to solve the most proper *Effects* of *Opium*, is more than enough) that such *Fumes*, or *Vapours*, can truly solve no *Effect* of *Opium*, unless it be that of *Death*, or some *deadly Symptoms*; nay, they will not solve the most likely to be caused by *Vapours*, *viz. Sleep*, which all Men (as *Wedelius* says) allow to be the *Effect* of *Fumes*, or *Vapours*, (in his *Opiologia*, *c.* 11. *p.* 35.) "*Somnum naturalem* (says "he) *omnes concedunt producere suaviores, & blandas* "*αἰαθυμιάσεις*, *seu Vapores primum αἰσθητήριον de-* "*mulcentes, qui cum spiritibus animalibus mixti torpi-* "*dos quasi illos reddunt:* That is, "*All grant that* "*kind and gentle Fumes do cause natural Sleep*, &c. Which is most certainly false; tho' I very much doubt, that this groundless *Presumption*, which (as he intimates) all embrace, has been a great cause of this *airy Imagination* of *Fumes* in the *Case* of *Opium*; because Men looked upon *Sleep* (agreed upon to be caused by *Fumes*) to be the *prime*, *leading*, and *most proper Effect* of *Opium*; which is also *false*, it being but a *meer Accident*, (as has been shown) and when it happens, generally requires *lying*, or *sitting still*, to assist it; whereas the *Watching*, that is the *Effect* of *Opium*, requires no *help*, and cannot be put off (as Sleep can, by *Motion*, *Action*, *&c.*) notwithstanding all *Endeavours* to the contrary. Now I would know of any

any Man, which is the moſt proper and natural *Effect* of any *Cauſe*, That which nothing can hinder, or that which every *Action* can? But I run too far upon this matter, which belongs more aptly to that part of this *Book*, that explains all the *Effects* of *Opium*; and ſo muſt return to that of *Fumes*, which do not cauſe *natural Sleep*, as manifeſtly appears,

1. Becauſe that which cauſes *natural Sleep*, muſt, in all Reaſon, (as it is always in the wiſe Work of *Nature*) bear a *Proportion* thereto; but *Fumes* (ſuppoſing their *Being*) bear no *Proportion* to our *Sleep*. Certainly a working *Labourer*, that toils all the *Day*, muſt ſpend the *Fumes* of his Body in the higheſt *degree*; and feeding upon dry *Bread* and *Cheeſe*, muſt breed feweſt *Fumes*; yet none ſleeps better or ſweeter than he. The like is to be ſaid of a *travelling* Man, a tired Perſon, *&c.* who often fall aſleep before they eat or drink to renew their *Fumes*, which they had ſpent in an extraordinary manner. Why *Sleep*, that is deſign'd for *Refreſhment* and *Recruit*, ſhould depend upon *Fumes*, no Man can tell; for then our *Refreſhment* would wholly depend thereon, and no Man have any *Recruit* by *Sleep*, but in *proportion* thereunto. Who dares accuſe our *Wiſe* and *Good Maker* of ſuch Contrivances, who in *Nature* always proportions Things to the *Exigencies* thereof? and therefore *Sleep* not to *Fumes*, but to that which was impair'd in us for *want* thereof; which is always contriv'd by *Wiſe Nature* (if you'll obſerve it) to be the prompting *Cauſe* to the *Recruit*; and then *Proportion* is duly obſerv'd, becauſe we are prompted exactly according to the *Exigence* or *Neceſſity of Nature*, as becomes the *Wiſdom* of our *Creator* and *Preſerver*. This *Rule* (if duly attended to) will eaſily, ſpeedily, and certainly lead

lead you to the *Knowledge* of the true *natural Cauſes* of *Hunger*, *Thirſt*, *Inclination to Sleep*, and all ſuch *Calls* for *Reſtauration*. All which I could ſoon ſatisfie you in, but that it is not my *Buſineſs* at preſent, and that it will too much anticipate my deſigned *Tract* of *Animal Mechaniſm*.

Nor doth *Labour* it ſelf bear any *exact Proportion* thereunto, becauſe many healthy People, that are idle all *day*, ſleep long, ſoundly, and ſweetly, every night, as well as *Labourers*: So that (in ſhort) it muſt be ſomewhat that belongs to *Watching* as ſuch; for *Sleep* generally bears the beſt *Proportion* to *Watching*. If we *watch* much, or little, our Sleep bears ſome *Proportion* thereto; tho' there may be in this, as well as in *Hunger*, *Thirſt*, *&c.* *Accidents*, that cauſe the *Promptitude* to be *more* or *leſs*, and ſo vary the true *natural Proportion*; all which have the Nature of *Diſeaſes*, as *canine Appetites*, *Coma's*, *Cæros*, *preternatural Thirſts*, *&c.*

What it is that *Watching* cauſes to prompt us to *Sleep*, muſt be ſome Impair made thereby as ſuch, and not the fooliſh Conceit of *Fumes*: And it were eaſie for me to illuſtrate what it is, but that it will require ſome Sheets of *Paper*, and (as I ſaid before) anticipate my *Diſcourſe* of *Animal Mechaniſm*, which I hoped to have publiſhed before this *Book*, and would have been moſt convenient, becauſe the *Principles* therein ſtated may ſerve to explain the *Effects* of *Opium*; but that the *want* of a few *Experiments* has (to my Grief) hitherto delay'd it; and therefore I muſt be put to much Trouble in this Work for want thereof, becauſe I am reſolved not to ſpare my ſelf, in order to ſatisfie the *Reader* in this great and unexplicated *Myſtery*.

2. If

2. If *Vapours* were the cauſe of *natural Sleep*, it is impoſſible that the *prick* of a *Pin*, or a *ſharp Sound*, &c. ſhould awake one ten or twenty times in an *Hour*; for *either* the *Prick* muſt in an *inſtant* diſcuſs all the *Fumes* in being, which is impoſſible to be imagined, and they as often return to cauſe *Sleep* again; *or* intercept their Motion from the *Stomach* to the *Head*, which no Man can have any Conception of the Efficacy of the *Pin*, or *Sound*, ſo to do: *Or* they muſt both *diſcuſs* and *intercept* the *Fumes*, (which indeed if the caſe were ſuch, would be neceſſary to make a clear *Awaking*) which is yet far more unconceivable. What *paltry Trifles* does the *World* embrace, inſtead of *Truth* and *Reaſon!*

3. Several Perſons (whereof I am one) do awake in a minute or two after they firſt fall aſleep in Bed at *night*; which would be abſolutely impoſſible, if *Fumes* cauſed *Sleep*; for the *Fumes* would increaſe *more* and *more*, and make one *more* and *more remote* from waking.

4. Why ſhould *warm Baths*, *Fomentations*, *Feet-waſhes*, *Head-waſhes*, *warm moiſt Weather*, the *Act of Venery*, the *Pleaſure of ſweet Melody*, *gentle rubbing of the Head* in a pleaſant manner, *ſcratching the Back* where it itches, and all gentle *Pleaſures* that are conſiſtent with *lying*, or *ſitting* ſtill, which do all cauſe a very free Perſpiration of *Fumes* at the *Pores*, (that are then moſt certainly opened by all thoſe Cauſes, as may be proved by ſtatick Demonſtration, Magnifying Glaſſes, *&c.*) cauſe Sleep, ſeeing they all cauſe a ſpending of the *Fumes?*

Obj. Some half-witted, unthinking *Caviller* may ſay, That ſuch Things ſtir up the *Vapours*, *&c.*

Anſw.

Answ. What such mean by *Vapours* stirr'd, is not easily determinable; but this I know, that all stir of *Humours*, or any other thing, hinders *Sleep*; and that the longer such Causes of opening the *Pores*, and consequently of perspiring *Fumes* do last, the more we are inclin'd by them to *Sleep*; so that the more our *Fumes* have been spent, the more we are inclined to *sleep*; which is a strange *Contradiction*, if *Fumes* be the cause of *Sleep*.

I can but smile to think how most Physicians come to call several things *Vapours:* First, they say, that *Sleep* is from *Vapours*; then call every thing *Vapours* (*right* or *wrong*) that inclines us to sleep, by reason of that false *Supposition:* How then comes *Camphire* not to be a great Causer of Sleep, that is so apt to evaporate?

5. *Fear, Sorrow, Grief, Melancholy, Depression of* Spirits, *Cold*, &c. do most certainly close the *Pores*, (as appears by *statick Experiments*) by which means *Vapours* are much crowded in the *Body*; yet all such *Grievances* do hinder *Sleep*, as they also do the *Effects* of *Opium* and *Drunkenness:* Therefore they do not proceed from *Fumes*, as the *World* imagines; for then these things that crowd in the *Fumes* and *Vapours*, would promote, not hinder *Sleep*.

6. If *Fumes* are the *cause* of *Sleep*, then are the cause of *Sleep* and *Vertigo's* (as the *Vaporanians allow*) the same, it follows then that we could never *sleep* without a *Vertigo*.

7. Many (as Dr. *Willis* says) eat their *Meat*, take their *Drink*, &c. as other People, yet do not *sleep* at all for many *Weeks* together; which were impossible, if the *Fumes* of *Meat* and *Drink* caused *Sleep*; for they, by *eating* and *drinking*,

must

muſt have thoſe *Fumes*, and conſequently *Sleep*, as other People, if that were true.

Thirdly, *They ſuppoſe and take it for granted*, (which I do not, for I know the contrary) *That* Opium, *while it is at Stomach, can affect the Brain*, &c. *no other way but by Fumes*; which is a moſt groundleſs Suppoſition: For,

1. How ſhould a *Lump* of *Curd* at *Stomach*, or the Haft of a *Knife ſwallow'd*, and many ſuch things, which can ſend no *Fumes* to the *Head*, cauſe *Convulſions*, *Head-achs*, *Vertigo's*, *Syncopes*, *Leipothymies* of the whole Man, *Maniæ*, *Furors*, &c. if there were not another *way* for things to affect the *Nervoſum Genus*, &c. while at *Stomach*, beſides ſending up *Vapours* to do it? But of this *matter*, to ſhew how a thing at *Stomach* may affect the *Brain*, and the *whole Syſtem of the Nerves*, &c. and how *Opium* does it without *Fumes*, the 17, 18, 19, 20, *&c. Chapters* will ſhew you at large: Therefore I ſhall ſay no more of this at *preſent*, for it is fit for us *firſt* to overthrow that *Suppoſition of Fumes and Vapours*, before we eſtabliſh our own. For farther *Satisfaction* then, as to that *general Suppoſition* of *Fumes*, let us duly and fully conſider Things; for it is not a ſlight matter to proceed againſt a *General Opinion*, that has continued through all *Ages*, or to wipe off the *Prejudices* acquired thereby. *Obſerve*,

1. That the *Brain* is a *Principal Part*.

2. That it is *very ſoft*, *tender*, and next to a *Fluid*.

3. That very *ſmall*, *fine*, *and gentle Things do highly offend it*, as the *Effluvia's* of ſweet, or ill-ſcented Things, cauſing *hyſterick* and *epileptical Fits*, *Syncopes*, *Faintings*, &c. It is alſo notorious among

among us *Phyſicians*, that a little *Fume*, ſcarce ſenſible as to *Quantity* or *Quality*, riſing from a *Toe*, *Finger*, &c. and arriving at the *Brain*, cauſes dreadful *epileptical Fits*, *Vertigo's*, &c.

4. That our *Wiſe* and *Provident Creator*, has therefore ſecured and fortified all the *Avenues* of the *Brain*, in a more particular manner, by ſeveral *Circumvallations*, viz.

Firſt, With the *Pia Mater*.

Secondly, With the *Dura Mater*, called ſo from its *Hardneſs*, *Solidity*, and *Strength*.

Thirdly, With a *ſtrong Skull*, of a round or arched *Figure*.

Fourthly, With the *Pericranium*.

All which belong to it particularly, beſides other *Integuments* common to it, with other Parts; as, 1. The *Skin*. 2. The *Cuticle*. 3. The *Membrana Carnoſa*. 4. The *Perioſtium*: All which do ſurround it; and after all, it is Thatched (as it were) with *Hair*.

5. That the ſame *Providence* has taken *care* (which is very obſervable) that none of the *Objects* of *Senſation*, nor (probably) any Particle, or *Effluvium*, that flies from them, ſhould ever reach the *Brain*, but only bare *Impulſes*, and they not immediately convey'd, but by the *Intervention* of a *fine*, *tenuious*, *ſoft*, *gentle*, and moſt agreeable *Aura*, *viz.* the *Animal Spirits*, leſt any Offence ſhould be given in the leaſt manner to this moſt tender, delicate, principal Part, and *Royal Seat* of the *Soul*; all which Care had never been, without Neceſſity; for *God* and *Nature* do nothing in *vain*.

And

And if you'll duly conſider the *Organs* of Senſation, that are near the *Brain*, you'll find that they are contrived as *Shutters*, to exclude all extraneous Particles from the *Brain*; for *Impulſes* might have been contrived without their *Intervention*, becauſe they do not alter or improve the *Impulſes* received from Objects; for if they did, we ſhould not have true notice of Things: And ſeeing they do not alter, or improve the *Impulſes*, of what *Uſe* ſhould they be but to exclude extraneous *Particles*, *Fumes*, *Effluvia's*, &c.

For *inſtance*: The *tremulous Motion* of the *Air*, in the caſe of *Sound*, would have as truly hit the *Auditory Nerve*, or *Membrane*, without the *Tympan*; and very often much truer without it, becauſe of the ſeveral *Faults* and *Diſorders* that it is liable to: Yet ſo neceſſary was it thought by the beſt of *Judges*, who cannot err, that it was rather to be placed there, with all its Inconveniences that might follow, than any way expoſe the *Brain*, though to the moſt gentle of Bodies, *viz.* the *Air*, by which (in all probability) the *Animal Spirits* themſelves are nouriſhed, or ſuſtained.

Were it not that extraneous Particles, or *Air*, would offend the *Brain*, What need is there of the *Tympan*, when we know as well by Experience, as by the aforeſaid *Reaſons*, that a *Dog*, &c. can hear as well without it, upon the firſt taking it off, but that the Hearing will afterward decay, becauſe the *Brain*, &c. being expoſed, will be injured?

What is evident in the caſe of the *Ear*, may be made ſo as to the *Noſe* and *Eyes*; for though ſome of my *Readers* may not eaſily conceive it, the Repreſentation of Things might have been conveyed by *Reflections* and *Refractions* of Light, without exclu-

excluding the *Air*, but that it was more convenient and safe for the *Brain*, and *Optick Nerve*, (which is much the same matter with the *Brain*, and a Production thereof) that the *Air* should be excluded.

6. Notwithstanding all this *Care* to exclude extraneous *Particles*, how fine soever, we do find that those very *Impulses*, conveyed by the *Animal Spirits* themselves, in the most gentle manner imaginable, do often offend the *Brain*.

Now fairly consider the great *Excellency* and *Use* of the *Brain*, *viz.* to separate the *Animal Spirits*, to accommodate the *Soul* with a fit Seat for it; its *Tenderness* and *Softness* to be next to *Liquidity*; how carefully it is guarded with about nine or ten *Circumvallations*, or considerable *Integuments*; that those we commonly call *Organs* of *Sensation*, are contrived for Shutters out (or Excluders) of the least *extraneous Particles*, *Effluvia's*, or *Aura*; that the least *Fume* that rises from any *Part*, and arrives at the *Brain*, causes such terrible and dismal *Effects*, and that most gentle touches of the *Animal Spirits* do offend it, so as to cause *tragical Events*, as *hysterick Fits*, *Vertigo's*, &c. Is it likely, that notwithstanding the *Considerableness*, *Tenderness*, *Use*, and *Excellency* of the *Brain*, the extraordinary Providence used in guarding it from *Effluvia's*, or *extraneous Particles*, how fine soever, and the apparent Mischiefs that the least *Fume*, nay, bare *Impulses*, presented by the *Animal Spirits*, do cause; that the same *Providence* that so guarded it (which does nothing in vain) should, after all its Care and nice Circumspection to exclude the least *Fume*, &c. permit, and freely let loose upon it, and into it, whole and even continual *Gusts*, *Blasts*, and *Vulcano's*, of *acid*, *acrimonious*, *putrid*, *hot*, *stinking*, *corrosive Fumes*, *Vapours* and *Steams*,

ariſing from *glutted*, *debauch'd*, and *ſurfeited Stomachs*, containing all imaginable *Traſh*, *Hodge-podge*, *Vermine*, *Choler*, &c. ſure it is much fitter quite to diſcharge and rid Nature of them at *Mouth*, or rather ſend them downward with their fit Companions, the *ſtinking Ordure* and *Excrements*, than preſer them to the Higheſt and Nobleſt *Part* of the *Animal* and *Sacred Manſion* of the *Soul*.

For if there be ſo *ready*, *free*, *open*, and *conſtant* a *Paſſage* (*ſenſible*, or *inſenſible*) for the *Fumes* of *Opium*, which never fails of its *Effects*; then certainly muſt the *Paſſage* be alike free to all other *Fumes* from the *Stomach*, ſeeing they are ſo to thoſe groſs, venomous, and pernicious *Fumes* of *Opium*, as *Willis*, and moſt of the *modern* and *ancient Phyſicians* do ſtate them to be: Then farewel *Soul*, *Brain*, *Life*, and *all*; for it is not conceivable that the Man can hold out one *Hour* under ſuch *horrid* and *diſmal Circumſtances*, and dreadful *Eructations* of *rude* and *crude Fumes*, who could not bear the arrival of the *leaſt Vapour*, ſcarce ſenſible in *Quantity* or *Quality*, ariſing from any other *Part*; Or is it a peculiar *Priviledge* that the *Stomach* has, thus to ſend *Farts* with their Heels upward, (as *Belching* is call'd) without any offence, to perfume the *Soul's Preſence-Chamber*, (ſaving your Preſence however?) Foh! for ſhame! What ſort of Opinions are theſe? What *thick*, *ſtinking*, and *dark Clouds*, *Scotomies*, and *Stupors*, muſt the *Opiniators* be under, by their own Conſent?

7. If this were the caſe, no *Part* in the whole *Body* would be in ſuch a miſerable ſtate as the *Chief*; for the *Rectum*, or *Colon*, are fitted and fortified by *Nature* to bear ſuch Things; ſo is not the *tender Brain*.

8. What

8. What Horſe's Brain, much leſs Humane one, could bear, inceſſant *Rakings*, *Penetrations*, *Stuffings* of ſuch *unnatural*, *indigeſted*, *heterogeneous*, *rugged*, *acid*, *acrimonious*, *putrid*, and *impetuous Fumes*? If

Gutta cavat Lapidem non vi ſed ſæpe cadendo;

What would become of the tender *Brain*, thus rudely rubb'd and grated, all the days of our *Lives*, if it could hold out any? for it is incredible it ſhould.

9. How would the *Pores* of that ſoft Subſtance, which have no leſs Office (as 'tis univerſally received) than to ſeparate *Animal Spirits*, (which are or ſhould be the fineſt and moſt ſubtile, tenuious, and principal Things in an *Animal*, next the *Soul* it ſelf) be diſcompoſed, torn, dilated, ſtuffed? What a bleſſed Secretion of Animal Spirits (if any) would there be!

10. It is obſerved by all, That the *Brain*, tho' very ſoft, receives the leaſt Change of any *Part* of the *Body*; which could never be (conſidering its tenderneſs) if it were ſo raked by all *ſorts* of *Fumes*; for then doubtleſs ſuch a Body would be moſt changed of any in *Colour*, *Subſtance*, *Texture*, *Bigneſs*, &c. What would become of *Memory*, and indeed of all the *Faculties* of the *Brain*? Can a ſoft, yielding *Subſtance*, continually diſcompoſed, preſerve *Impreſſions* made thereon? If *Fumes* flow'd continually through the *Brain*, they muſt wear out all *Impreſſion*, yea, and the *Brain* it ſelf, in a ſhort time.

11. It would be very dangerous to *eat* or *drink*, If the *Brain* muſt ſuffer ſo much by the *Fumes* of *Meat*, *Wine*, &c. It would be hard to know whether it was beſt to *eat* or *not*, for both muſt be *fatal*.

12. What a vaſt *Difference* ſhould we obſerve, as to *Serenity* of *Mind*, &c. when empty and full? For in this laſt caſe, the *Brain* muſt be all in a *Cloud*, or a *Cloud* in it, or *both*; yet are Men much more *ſerene*, prompt, and fit for any thing, after ſome Glaſſes of *Wine*, than before, and after moderate Eating, than when Hungry, which makes them faint, peeviſh, ill-humour'd, and liſtleſs.

13. If the *Vapours*, or *Fumes*, of *Opium*, flying up to the *Brain*, cauſed all its *Effects*, it is very ſtrange that our *Fumi venduli* had not long ſince found out the *Mountebank-Gambol* of ſtanding upon their *Heads*, to prevent all Miſchief from *Opium* taken in a great *Doſe*; for *Fumes* in a warm living Body would not deſcend into the *Head*. I wonder they did not find out ſuch an eaſie and natural Conſequence of their *Hypotheſis*, if true; they might then have boldly mounted any Stage, freely taken *Opium* in the ſight of the admiring *Rabble*; their *Summerſets*, *Going* upon their *Hands*, &c. would have ſecured them, and turn'd Danger *topſie-turvy* by the help of a *comical Geſture*. This is indeed ſomewhat to *purpoſe*, if it ſucceeds; if *not*, I ſhould think 'twere enough to ridicule their *Hypotheſis* out of all *Credit*, without any farther *Arguments*. I dare join *Iſſue* with them upon that *Point*, that it will not ſucceed, though a neceſſary *Conſequence* of their *Opinion*, if true; wherein they will have this Advantage, That they'll confeſs with one that never did (or will) try it, as being well aſſured of the Falſity of both the *Hypotheſis*, and the *Experiment*, without ſuch a *Trial of Skill*.

Now I think that I have ſaid enough, and would willingly give over arguing, and ſpending any more *Time* to confute an *Hypotheſis* ſo abſurd, that it muſt needs appear ſo to any regular Thinker

Thinker without my *Help*; but all are not ſuch, and the *Prejudices general* and *inveterate*, and of *ſome thouſands* of Years ſtanding, having continued through all *Ages* to this *day*; and I would fain quite put out this falſe *Light*, that (like *Will of the Wiſp*) has brought many a Man into the *Pit* of *Deſtruction*, or *Grave*, while *Phyſicians* were guided thereby. Therefore it being no ſlight *Work* to undeceive many, and a very good Work (if poſſible) to undeceive all; I will (leſt what I have ſaid be not ſufficient to that *end*) add ſomewhat more to the ſame *purpoſe*; though (I doubt) ſome will not be convinced till I ſhew them how Things while at Stomach, may cauſe all the *Effects* of *Opium*, by a *ſenſible Operation*, without the *Help* of *Fumes*, *Vapours*, *Effluvia's*, *Aura*, or any any ſuch thing; which have been the *Aſylum* of the ſhort-ſighted, that could ſee no other Means, and therefore (as was ſaid) concluded Things muſt be as they thought, preſuming that nothing could be that they did not ſee. A ſpecial *Inference*, and a very improving one, which muſt cauſe People never to ſeek for any thing! For why ſhould they, that think there is nothing but what they ſee, look any farther? To proceed then:

14. It is agreed on all *hands*, (as I take it) That the *Animal Spirits* are not generated till there is an *Appulſe* of the *Bloud* at the *Brain*: Can it therefore be imagined, That Indulgent and Wiſe *Nature* ſhould contrive a ſpeedier *Way* to *deſtroy*, *diminiſh*, or *diſable the Spirits*, by *Fumes* and *Vapours* out of the *Stomach*, than to generate them? Theſe are not the *Ways* of *Equal Nature*, which deſtroys and generates by the ſame *Road*; ſo that if *Animal Spirits* are generated by the *Bloud*, they are diminiſhed by ſome *Defect* therein; as *want* of

Matter in the *Bloud* for that *purpoſe*; the *Bloud* not arriving at the *Brain*, and the like.

Note, That I ſpoke in the laſt *Paragraph* of *diminiſhing*, (or deſtroying) not bare *diſabling* the *Spirits*; for the *Spirits*, or *ſenſitive Soul*, may be depreſſed (or diſabled) for ſome *time*, and excited, or elevated, by other *means* than that of the *Bloud*, as by *Pleaſure* or *Diſpleaſure*, *Joy* or *Grief*, *&c.* Thus *good News*, or the *Pleaſure* of any of the *Senſes*, enliven, invigorate, or elevate the *Spirits*, or *ſenſitive Soul*, in a *moment*; this is the *way* that *God* has provided for us upon ſudden *Exigencies*, *Deliquiums*, *Lepothymies*, &c. and thus *Cordials work* ſo ſpeedily (as you'll find hereafter;) ſo may there be a *ſudden Depreſſion* of the *Spirits*, as by *ill News*, *Pain*, &c. which (if you'll be pleaſed to remember) will much illuſtrate Things hereafter.

15. The ordinary *Strainers* of the *Body* are ſo ordered, that they will not admit *Particles* of another *Figure*, eſpecially if larger than the *proper Particles*; much more ſhould it be ſo with the *Principal Strainer* of the whole Body, (I mean the *Brain*) both for its *ſafety*, and of the *whole*, which depends upon the *Animal Spirits*, that are ſtrained, or ſeparated, from the *Bloud* in the *Brain*; therefore the Particles of *Opium*, which are eſteem'd groſs by all, (however are more ſo than the moſt *tenuious Animal Spirits*) cannot enter into the *Pores* of the *Brain*, to diminiſh or diſable the *Animal Spirits*, in caſe its Fume arrived there.

16. It was never the *Method* of *Nature* to ſend Things crude, unprepared, and undigeſted, into the inmoſt and principal *Receſſes* and Parts of the *Body*, without paſſing gradually by the ſeveral Dige-

Digeſtions, Concoctions, Changes, Percolations, Circulations, *&c.* preparatory thereunto; therefore it will not permit crude and indigeſted *Fumes* any *acceß* to the *Brain*, till they have (as it were) performed their *Quarentine* elſewhere; nor will *Nature*, which always acts conſentaneous to it ſelf, *provide* any *Paſſage* for ſuch rude and crude *Foreigners* and *Strangers*, to ravage the *principal Part* of an *Animal*.

17. They cannot paſs by the *Arteries*, which carry nothing out of the *Stomach*, but all into it, or towards it, and that with a violent Motion, which oppoſes any thing that would paſs that *way*.

18. Nor by the *Veins*, which carry nothing into the *Brain*; but if they enter'd the *Veins* at *Stomach*, they muſt thence paſs into the *Right Ventricle* of the *Heart*, where being rarefied by *Heat*, they muſt take up much *room*, and ſadly diſcompoſe the *Motion* of the *Bloud*, and alſo enter this *principal Part* in a *crude condition*, (tho' much better able to bear them than the *Brain*) then muſt they paſs into the *Lungs*, where you may be ſure they will be ſo ſaucy as to take up the uppermoſt *Room*; and how they will be brought down again into the *Left Ventricle* of the *Heart*, (which they muſt vouchſafe to do, before they can get into the *Brain*) none can tell: There then muſt they ſtick, and cauſe an *Aſthma*, unleſs the Man has the good Luck to be rid of theſe *Rovers* by *Breething*, and then (Joy be with them! as there will be, when they are gone) they are loſt, and never arrive at the *Brain*: And if it could be conceived, that they condeſcended to come down from the *Lungs*, (contrary to their *Levity*, which is not to be *thought*) what *Pranks* muſt they play in the *Left Ventricle* of the *Heart*, and what at *Brain*, conſidering it cannot bear the *leaſt Vapours*? (as

has been ſhewn;) whereas in this *Caſe* there muſt be a continual Stream thereof, and conſequently a *diſcontinuance* of the *Bloud*, and its Motion. See then how little *Thought* they muſt have, that aſſert it is convey'd with the *Bloud* either to the *Veins* or *Arteries!*

19. Nor by the *Lympheducts*; for then they muſt, contrary to their *natural Levity*, deſcend into the *Receptaculum Chyli*, and out of the *Subclavials* into the *Right Ventricle* of the *Heart*, and afterward run all that wild Riſque mentioned in the laſt *Paragraph*, which was ſhewn to be impoſſible.

20. Nor by the *Nerves*; for then they muſt either run up in the *Road* of the *Animal Spirits*, or in ſome *By-way*. If they paſſed by the *Road* of the *Spirits*, then muſt the *Spirits* be ſtopp'd for that time, (which is no ſhort one) and we ſuffer a *Paralyſis* of the *Stomach* all that time, or be much diſturbed and interrupted; then ſhould we have *Convulſions*, or at leaſt ſome *degree* of a *Paralyſis* of the *Stomach*.

And if they paſſed by ſome *By-way*, or *Road*, beſides that of the *Animal Spirits*, then muſt it be a *full*, or an *empty one*; if full, that Humour (as ſuppoſe a *Succus Nutricius*, for once) muſt be diſturbed and diſcontinued, (as the Animal Spirits were ſhown to be;) and if empty, it would follow, that *Nature* had *void* and *uſeleſs Ducts*, which none ever had the Folly or Confidence to aſſert; or that *Nature* contrived them for that *purpoſe*, which is (as has been ſhown) directly againſt its *Methods* and *Advantage*.

But after all, whither would you have them march in this *By-Road?* for they could not mix or communicate (as good Luck is) with the *Spirits*; and if they did, it is impoſſible it ſhould be without ſuch Diſturbances as I mentioned would follow, if they paſſed in the *Road* of the *Spirits*; it

is

is not common Sense, that such *crude Blasts* should *meliorate*, or *enliven the Spirits*, to cause *Brukneß*, *Bravery*, *Serenity*, *Courage*, *Magnanimity*, as *Opium* does, much less if those *Fumes* stopp'd and crowded in the *Brain*, and any way hinder'd the *Generation* of *Animal Spirits*, as the common *Assertion* is.

The like is to be said of their passing between the *Pia Mater*, and the medullary Part of the Nerve, (which cannot be allow'd, because of its close *adherence* thereto) with this addition, That they would constantly cause a *violent Head-ach*, which *Opium*, and *Meals*, (to which *Fumes* are particularly attributed) do often cure.

So if they got up to the *Head*, between the *Pia* and *Dura Mater*, it is *Head-achs*, and not the *Symptoms* of *Opium*, that they would produce; which *Head-achs* (as was said) *Opium* and *Meals* do cure.

21. *Lastly*, If they passed by any means quite on the outside of the *Nerves* and their *Membranes*, (*viz.* the *Pia*, and *Dura Mater*) then must they take their Lodgment (if within the *Skull*) between the *Dura Mater* and the *Skull*, and produce no other *Symptom* but a Head-ach, which (as was said) *Opium* and *Meals* rather cure than produce; and if without the *Skull*, it is quite beside the *Cushion*, and the *Vaporarians* own *Intentson*; for in all these last *Cases*, they could not affect the *Animal Spirits* for good or evil. Many and very many things may be added, to shew the *Impossibilities*, *Inconveniences*, *Incoherences*, *Absurdities*, &c. that attend the *Passage* of the *Fumes* and *Vapours* into the *Brain*, *Head*, &c.

22. I had forgot mentioning the *Absurdity* of its passing up at *Gullet*, and so to the *Head*, because I could not imagine that any one would be so

ſo beaſtly an *Animal* as to belch up an *Argument* of that kind, conſidering our very *Senſes* tell us, that what comes up that way paſſes out at *Mouth* or *Noſtrils*, and becauſe, if it were ſo, the *Operation* of *Opium*, &c. would be in *proportion* to our *Belching*, which is *ridiculous*.

23. The greateſt *Comfort* of a *Cordial* is at firſt, or ſoon after it is taken; but if 'its *Comfort* were by *Fumes*, or *Effluvia's*, paſſing to the *Bloud*, or any where beſides, the *Comfort* would (as their *Cauſe* of *Fumes* do) increaſe for a long time, and be more after a good while than at firſt. So,

24. If *Opium* operated by *Fumes* while at *Stomach*, which muſt gradually increaſe continually, how comes *Opium* to be at the height of its Operation in a ſhort time, *viz.* in about *half an Hour* after it begins ſenſibly to operate, or an *Hour* at fartheſt, and not increaſe continually in its Operation, as their pretended Cauſe the *Fumes* muſt do by continual ſteaming?

25. If *Opium* operated by ſending *Fumes* by *Paſſages*, &c. from the *Stomach* to the *Brain*, I ſhould think that when it has got out of the *Stomach*, as into the *Inteſtines*, *lacteal Veins*, &c. there ſhould be a kind of *Interval* of its *Operation*, (which is never obſerv'd) till it got into the *Bloud* again; therefore it does not operate by *Fumes*, for the *Pylorus* is always ſhut, but when ſomewhat is ſent downward, which would hinder the mounting of the *Vapours* into the *Stomach*, in order to paſs to the *Brain*.

26. If *Vapours* were the cauſe of *Sleep* after *Meals*, then ſhould we be more ſleepy two or three *Hours* after *Meals*, becauſe of the *abundance* of the *Fumes* that would be crowded into the *Brain* by that *time*; but we are more ſleepy preſently after *Meals*, and if we indulge it but for a *quarter* of an *Hour*, we are refreſhed, and far from *ſleepineſs* after-

afterward, tho' the *Fumes* (if that *Hypotheſis* were true) would be much more at *Brain* two or three *Hours* after the *Meal*: So it is in the *caſe* of *Wine*, if one take a ſhort *Nap* after ſome *Glaſſes*, he may drink a great many afterward without being ſleepy; which plainly proves, that it is not the *Fumes* of the *Wine* is the cauſe of the *Sleep*, becauſe he is not at all *ſleepy*, when there muſt be more *Fumes*.

27. All allow, that hot *Fumes* aſſaulting the *Brain* cauſe *Phrenſies*; if that be true, then the *Fumes* of *Wine* and *Opium* (which are both very hot) muſt always do ſo; but *Opium* and *Wine* alſo do often cauſe *Compoſure*, *Good Humour*, *Sleep*, &c. which are contrary to *Phrenſies*; therefore they do not operate by *Fumes*.

28. "*If Sleep* (ſays *Helmont*, the only Man that "I have read who is againſt *Vapours*) *is cauſed by* "*Vapours aſcending from the Stomach to the Head*, "*obſtructing and intercepting all the Paſſages of Sen-* "*ſation*, *Motion*, *Speech*, *Judgment*, &c. (*as the* "*Schools ſay*) *then a Diſeaſe would have been be-* "*fore the Fall of* Adam, *becauſe Sleep would have* "*been a Diſeaſe*, *that is*, *a flatulent and vaporous* "*Paſſie.*

29. All allow *Vomitives* and *Purgers* to operate by *Irritation*, or a *grievous Senſation* of the *Membranes* of the *Stomach*; Why not *Wine*, *Cordials*, *Opium*, &c. by a *pleaſant Senſation*? *Cujus eſt Dolor* (*aut Gravamen*) *ejuſdem eſt Voluptas*; and as a *grievous Senſation* (or Pain) cauſes *Melancholy*, *Depreſſion* of *Spirits*, *Fretfulneſs*, *Laſſitude*, &c. ſo a *pleaſant Senſation* cauſes *Comfort*, *Elevation* of the *Spirits*, *Euphory*, &c. But we have not cleared the *Way* ſufficiently for theſe Matters yet, which will in due *time* be ſolemnly conſidered.

Obj. It may be ſaid, That both *Vomitives* and *Purgatives* take ſome *time* before they operate, unleſs a *Nauſea* upon *Averſion* cauſes them to work ſooner; for Things muſt have *time* to inſinuate themſelves (or ſoak) through the *Cruſta Carnoſa* of the *Stomach*, and afterwards to affect its *ſenſile Coat*; which argues that *Wine* and *Cordials*, which operate immediately, do not operate that *way*, but by *Fumes* (or *Effluviums*) paſſing into the *Brain*, or *Bloud*.

Anſw. I doubt indeed, that this *Difference* may be an occaſion of referring the Effects of *Cordials*, and thoſe of *Emitticks* and *Catharticks*, to different *Cauſes*; but it is very ſtrange, that they ſhould go ſo far as the *Bloud*, or *Brain*, to ſeek for the *Cauſe* of the *Operation* of *Cordials*, which operate in a *Moment*, and go no farther than the Stomach for the Cauſe of the Operation of *Vomatives* and *Purgatives*, which take more *time* to operate; eſpecially ſeeing the *Bloud* and *Brain* have no *Senſation*, and that all *ſenſitive Comforts* happen by that means, I think it were much more proper, firſt, to conſider the *immediate Part* upon which they inſiſt, (when at *Stomach*) eſpecially ſeeing it is ſo very *ſenſible*, before we run roving I know not whither, to ſeek for the Cauſe of a Thing that works, pleaſes, and comforts the *Stomach*, as ſoon as it is down. I take my ſelf running off the proper *Subject* Matter of this *Chapter*, and anticipating that of another; therefore I will be ſhort, and deliver my *Opinion* in this Caſe by way of Poſition, with a familiar Inſtance to illuſtrate it, which may in ſome meaſure prepare you for the Proof of it, and what is to be ſaid thereof more at large hereafter

I ſay then, that *hot ſpirituous Cordials*, (for ſuch indeed all *proper Cordials* are) as *Brandy*, Dr. *Stephens's Water*, and *ſuch-like*, having *ſulphureous Particles* ſo prepared and diſpoſed towards *Heat*, or *Fire*, that they are as it were in *Potentia proxima* (or *next Diſpoſition*) thereto; are mighty apt to contract a *Heat*, as you find by *Spirit of Wine*, or *Brandy*, kept the leaſt *time* in a *warm Place*, or (to come cloſer to the matter) in your *Mouth*; wherein being actuated by its *Heat*, they will as in an *inſtant* grow ſo hot and active, that you can hardly bear them, becauſe *Particles* of *Heat* which penetrate any *Metal*, *Glaſs*, &c. immediately as ſoon as applied thereto, will much more eaſily and ſooner penetrate our ſoft *Parts* at Mouth, or the *Cruſta Carnoſa* at *Stomach*, and ſo reach the moſt *ſenſile Coat* thereof, *pleaſing*, *comforting*, and *exciting* the *Spiritus inſitos* as in a *moment* by their *ſpirituous Heat*, which we actually feel and ſenſibly find to pleaſe and comfort the *Stomach*.

But if ſome *Purging Tincture* had been put into the *Cordial*, or *Brandy*, this would not have ſoaked through the *Cruſta Carnoſa* under ſome *time*, and conſequently not operated till it had. This may be moſt manifeſtly illuſtrated by ſome *hot Brandy*, or indeed any hot Liquid put into a porous Diſh ſet upon one's *Hand*, which preſently warms it; but if the Liquid be tinged with any thing, that *Tincture* will not reach the Hand, till the Liquor, which is its *Vehicle*, ſoaks through, which may be in an *Hour* (*more* or *leſs*) according to the Poroſity of the *Wood*, which Tincture is to be compared to the *Purgative* at *Stomach*.

Hence it follows, That all *Cordials* ſhould be a *ſpirituous* Liquid, if intended for ſudden *Refreſhment*, which *Experience* has taught, and be given actually warm'd, if a very nimble Comfort be required; tho'

tho' the great *Heat* of the *Stomach*, above that of the *Mouth*, will generally be ſufficient. Thus may the *Stomach* be pleaſed and comforted, grieved and purged, with the ſame *Draught*; but *Gracious Providence* has given the *ſtart* to the *Cordial*, which immediately comforts us as a *Heater*.

30. If *Opium* operated by ſuch *Fumes*, it would (at leaſt in a *liquid Form*) begin its *Operation* as ſoon as it is at Stomach; for it would begin to ſend up *Fumes* as ſoon as it began to be warm, which is preſently, and be at a very conſiderable *Height* of *fuming*, and conſequently of *Operation*, in one *minute*, which is about the ſpace of ſeventy ordinary Pulſes; but we do not find it begin to operate in that *Form*, under twenty, thirty, or forty Minutes, which is much about the *time* that a more agreeable, and not nauſeated *Vomitive*, or *Purger*, begin to affect the *ſenſile Coat* of the *Stomach*, and give intimation of their ſo doing. All which, and the Senſe of Pleaſure that we actually then feel at *Stomach*, makes it probable that it operates by affecting the *Stomach pleaſantly* and comfortably, (after the manner of generous *Wine*) as *Purgers* and *Vomatives* do by affecting it *grievouſly*, all of them (*except* the *Wine*, that pleaſes and comforts ſooner becauſe of its Particles of *Heat* gain'd by *Fermentation*) operating much in the ſame *time*, becauſe they take like leiſure to ſoak through the *Cruſta Carnoſa* to the *ſenſile Coat* of the *Stomach*.

31. All ſenſitive *Pleaſure*, *Comfort*, &c. are received by the *Senſes*; and though any Part were ſome way benefited, that has no *Senſe*, no *Comfort* would be perceived; without *Perception*, none could ſay that he is comforted: What fitter Part is there to be pleaſed, and comforted by *Senſation*, than the *Stomach*? which has ſuch exquiſite Senſe, that it can diſcern the *vomitory Particles* in

Infu-

Infusion of the *Crocus*, or *Regulus* of *Antimony*, which no *Sensation* but that at *Stomach* can discern; and so small, that a *thousand Vomitories* made thereof by Infusion, do not sensibly diminish the *Crocus*, or *Regulus*, as to *Weight*, or *Bulk*; nor can I conceive where any sensible *Comfort* can be perceiv'd by a spoonful of Cordial but at *Stomach*, where it actually is, and upon whose Coats it immediately insists; Is it not there that we feel the *Comfort*? and where should we find it but there? What would the *Effluviums* of a Spoonful signifie, if mix'd with 100000 *times* as much *insensile Bloud*? and what Part (besides the *Stomach*) that the *Bloud* touches, can be sensible of it? So that if *Effluviums* were granted, 'tis thither they must return to cause any considerable *Pleasure*, or *Comfort*: But what need any *Return* of the inconsiderable *Effluvia*, when the main *Body* of the Cordial (yea, all) lies upon the *Stomach* already?

I must forbear running into the Business of other *Chapters*, having been tedious enough upon the Subject of this, and the rather, because it was so general and so rooted an *Opinion* in the Minds of *Men*, in all *Ages*, and in all *Sects* of *Physicians* and *Natural Philosophers*, that I could not say too much to endeavour to free the *World* from the Slavery of such an *Imposition*, and the innumerable ill Consequences of such a fundamental and overgrown *Errour*.

Which certainly must have been long since exploded, if ingenious Men had first thought, and then spoke freely; but the *Truth* is, there were many and great Causes to the contrary, as those intimated in the last *Paragraph*, and the mighty *Usefulness*, and ready Officiousness of that Opinion of *Fumes*, to answer for all the more obscure and latent Causes of the *Maladies* and *Disasters* of the *Brain*

Brain and *Genus Nervoſum*. If any enquired or called for the *Cauſe* of a *Vertigo*, the *Phyſician* anſwered (*Fumes*;) of *Epilepſies*, it was anſwered (*Fumes*;) of *Scotomies*, it was *Fumes*; of *Headachs*, *Megrims*, *Coma's*, *Caros*, *Lethargies*, &c. it was *Fumes*; of *Hyſterick Fits*, *Convulſions*, *Spaſms*, *Cramps*, &c. it was *Fumes*; nay, they anſwered as Cauſes to all *Diſtillations*, *Catarrhs*, *Epiphora's*, (or weeping *Eyes*) and all, even ordinary *Tears*; all which they ſaid were only theſe *Fumes* turn'd into *Water* by the *Coldneſs* of the *Brain*, as they are in a *Still*, or *Alembick*; ſo hot *Fumes* accounted for *Phrenſies*, *Deliriums*, *Ravings*, &c. So that however other *Heads* were, the *Phyſician's* was ſtuff'd therewith; and all *Meteors* of the *Microcoſm's* Upper *Region*, whether *hot* or *cold*, were (as thoſe in the *Macrocoſm*) formed out of *Fumes*, as he imagined.

Thus you ſee all the *Opinions* and *Hypotheſiſes* that have been, concerning the *Operation* of *Opium*, to be moſt abſurd, and directly contrary to all *Senſe*, *Reaſon*, and *Experience*.

CHAP.

CHAP. XI.

Opium *does not diminiſh or diſable the Spirits by any means whatſoever.*

HAving ſufficiently demonſtrated, that *Opium* cannot *diminiſh* or *diſable the Spirits* by the *cold Quality* of the *Ancients*, or *Fumes* of the *Moderns*, and that neither of them have as much as any *Being*; I ſhall now add, that *Opium* does not *diminiſh, or diſable the Spirits by any other means whatſoever.*

I would not be miſtaken, when I ſay, That *Opium* does not *diminiſh*, or *diſable the Spirits* by any means, (for there is nothing ſo good in *Nature*, but will do it, if uſed unduely, or immoderately, as *Wine*, *Bread*, *Milk*, *Honey*, *Sugar*, *Beer*, *&c.* in exceſs) for I intend, that it does not do it when *duely* and *moderately* uſed.

1. That which refreſhes the Wearied, and highly prevents *Wearineſs*, muſt add to, or excite the Spirits, which is directly contrary to *diminiſhing*, or *diſabling* them; but *Opium* does in a moſt eminent manner refreſh the Wearied, and prevent *Wearineſs*, therefore it does not diminiſh, or diſable the *Spirits*.

Some have been ſo ſilly, and inadvertent, as to object, that it refreſh'd the Weary only by *Sleep*; It is *Matter of Fact*, that it refreſhes them whether they *Sleep*, or no, and that without failing as often as it is uſed in that Caſe.

Others (that were no Wiſer) have ſaid, that it only took off the *ſenſe* of *Wearineſs* by ſtupifying, which happened by the *diminiſhing*, or *diſabling* of the *Animal Spirits*. Bare Inſenſibleneſs cannot enable the Spirits to *Labour* with eminent *Briskneſs* and *Alacrity*, as Men moſt certainly do after *Opium* is taken, being finely *enlivened*, and *invigorated*, as with *generous Wine*; if they do not know this to be true, let them for ſhame hold their *Tongues*, till they know *Matter of Fact*, which if they will not, they proclaim themſelves to be *idle* and *impertinent Babblers*; but if they will patiently and wiſely abſtain arguing, till they are ſatisfied as to *Matter of Fact*, then will they be paſt *Opinion* and *Hypotheſis* in that Caſe; for they will have ſenſible and certain *Knowledge of the contrary*, and the Truth of what I ſay; which will end all *Controverſy*, and *precarious Squabbles* upon falſe *Suppoſitions*, (as the manner is) that cannot lead them to what is Right, but by meer chance, and never to a true *Knowledge*, that they are in the Right, which makes it none in effect; for they can do nothing with *Aſſurance*, but only ſuppoſe, and hope they are in the *Right*, when they are as much out (to their Patient's ſorrow) as *Phyſicians* have been in the *cold Quality*, and *Fumes of* Opium.

It is true, that a *Grain* (or Two) of *Opium*, will, if a Man compoſes himſelf, *ſitting*, or *lying ſtill*, cauſe a *Sleepineſs*, equal to that cauſed by ſpending the *Spirits* by a *Day's Labour*; but ſpending of the *Spirits* is not the only, no, nor beſt *proportioned*, or more *adequate* cauſe thereof, (as I have ſhewn:) If loſs of Spirit were the adequate cauſe of *Sleep*, how ſhould good and generous Wine cauſe *Sleepineſs* after that eminent Rate as it does in moſt People? How ſhould the moſt pleaſing

pleasing Musick incline such as *lie*, or sit *still*, to sleep? but if one Dances thereto, it makes him more lively and brisk than ordinary. The like exactly do *Wine* and *Opium*, if Men *lie*, or *sit still*; but otherwise, they make them much more brisk and lively, and able to undergo *Labour*, *Action*, *&c.* Which *Note*, that you may not any more wonder, that *Enliveners* and *Exciters* of the *Spirits* do cause *Sleep*, as well as *Diminishers* thereof; and observe, that they are all pleasing things, as *Musick*, *Wine*, and *Opium*, which cause *Pleasant Dreams*, *Pleasant Watchings*, *Pleasant Humours*, *&c.* Expect more of this Matter in the *following Chapters*, and all by *degrees*; according as I Judge the prejudiced *World* will bear Things: For a great *Paradox* (how true soever) must not be abruptly obtruded, but *gently*, and *gradually* ushered in by insinuating *Reasonings*, otherwise it will be entertained like a rude *Stranger*, that contradicts a *Multitude* in *Fashions* and *Customs* that they have always used, and judged to be the very best (however blameable.)

Consider, that if *Opium diminished* or *disabled the Spirits*, proportionable to the *Sleepiness* that it causes, as a hard *Day's* Labour does, then if *Opium* were given a Man after a hard *Day's* Labour, it would be, as it were, adding another hard *Day's Labour* to cure it, the *Day's Labour* and *Opium* impairing the *Spirits* alike; Think what a miserable Condition the poor Man would be in, especially if Sleep did not make him some amends, it would be such as were utterly intollerable; but so far is *Opium* from any such *Effect*, that it refreshes him tho' he Sleeps not at all after the hard *Day's Labour*, and not only so, but will enable him to Work all the following Night with great *Alacrity*, if need requires it.

What a *Condition* would thoſe be in, who take a *Drachm* of it twice a day for 10, 20, or 30 years? Nay, how could any poſſibly do it for half 10 days, if a *Grain* or Two deſtroyed the *Spirits* ſo much, as to cauſe *Sleepineſs* thereby, as *hard Labour* does? Which they muſt allow, that aſſert it cauſes Sleep by *diminiſhing, or diſabling the Spirits.*

But ſome may ſay, (tho' very inconſiderately) that it only *diſables* them for the *time* of its Operation; That is ſtrange, indeed, conſidering that even during that time they are moſtly enabled to *Work*, or *Labour*, tho' tired before; and that it,

2. Cauſes *Comfort, Refreſhment, Ovation of the Spirits*, all the *time* of its Operation, as *Wine* moderately taken does, eſpecially if People keep themſelves in *Action, Labour, &c.* otherwiſe, indeed, they may fall aſleep upon the comfortable *ſatisfaction, contentation* of Mind, and *acquieſcence* of Spirit, that it occaſions, as *Wine* does.

3. The *firſt Effect* that we find of *Opium* (which may therefore probably be a very *leading, fundamental*, and *ſignificant Effect*) is, that it cauſes a moſt *agreeable, pleaſant, and charming ſenſation about the Region of the Stomach*; which if one *lies*, or *ſits ſtill*, inclines him to *Sleep*, if not, it makes him *gay, good humour'd, brave, &c.* It is a *Pleaſure* ſo ſweet, and *delicious*, that tho' I endeavour'd to expreſs it by the *Ovation of the Spirits* upon Joy, a *good Genius* informing a Man, or the *Helmonſians Archeus* in his beſt *Humour*, or a continual *Venereal Pleaſure*, Wine drank *ad Hilaritatem, &c.* yet (I doubt) all my Ways of expreſſing it do come ſhort of the *charming Complacency* that it cauſes; Therefore if *Wine, Muſick, a good Meal, agreeable Frication of the Head or Back*, the *ſound* of

of *Waters*, *&c.* do incline us to *Sleep* by the *Pleaſure* thereof, which lulls and ſooths us to it, (as is moſt certain, if we *ſit*, or *lie ſtill*) much more muſt the high *Charms* of *Opium* cauſe it.

That it is a *Pleaſure* that affects by one of our *Senſes*, namely by *Feeling*, is indiſputable; for it is not a *Pleaſure* of the *Eye*, *Noſe*, *Tongue*, or *Ear*, and it muſt be *ſenſitive*, becauſe cauſed by *Matter*; and that *Opium* has (doubtleſs) the like *Effect* upon *Brutes*, who have no other *Pleaſure*, but what is *ſenſitive*; That it is at *Stomach* is alſo *evident*, where we can be pleaſed only by the *Senſe of Feeling*; That it is involuntary, and pleaſes us whether we will or no, and that the ſame Particles excite *Venery*, *Itching*, *&c.*

Now all the *Senſes* (eſpecially *Feeling*, and particularly that at *Stomach*) are given us for *Watches*, and *Sentinels*, to diſcover and give *notice* of what is, or is not *good* and agreeable to our *Animal Nature*; That upon notice of what is good, and agreeable, *Pleaſure*, *Comfort*, *Satisfaction*, *&c.* are conceived; otherwiſe *Diſpleaſure*, *Diſcomfort*, and *Diſſatisfaction*.

What *diminiſhes* or *diſables* our Spirits, does us the greateſt *Evil* that can be, and conſequently *Senſation* would, according to its *Office*, give us ſuch notice thereof as would cauſe *Diſpleaſure*, *&c.* otherwiſe theſe *Sentinels*, that *God* and *Nature* have appointed for *faithful Notice*, would (inſtead of truſty ſervice, which is the *End* they are made for) deceive us, and conſequently do us miſchief, rather than good; which is very Prophane (if not *Blaſphemous*) to aſſert, as being highly abuſive of *God's Goodneſs* and *Wiſdom*, to make Things in *Nature*, that would not only not anſwer, but

act quite contrary to their *Ends*; it follows then, that what cauſes ſuch a mighty agreeable, and pleaſant *Senſation* at *Stomach*, which is the greateſt, and moſt accurate Judge of what is, or is not agreeable to the *Animal*, cannot be deſtructive, or diſabling of its *Spirits*, which are the moſt excellent, and uſeful Things, that belong thereto; Therefore *Opium*, which ſo mightily recommends it ſelf to, pleaſes, and comforts the greateſt *Judge* that *God* has given to a ſenſible Creature to diſcern what is *good* and *evil* for it, cannot *diminiſh or diſable our Spirits*.

One may ſay, (what I dare not) that the Senſation at *Stomach* may deceive us.

We may deceive our ſelves, and ſay ſo, when that which pleaſes the *Stomach*, does not pleaſe our perverted *Imagination*, which makes no *Argument*; let us therefore conſider Things where there is no ſuch vain *Imagination* to contradict the good *Ends* of Nature; if the Stomach and Senſes in a *Brute* or meer Animal, which has no other means to Judge of what is *good* or *evil* for it, ſhould not Judge aright, all the Animals in the whole World would ſoon periſh. It is the vain Opinion of Men that perſwades them that Things are *cold*, when *hot*, *&c.* as in the Caſe of *Opium*, when the Senſes truely inform that it is *hot*; If you'll ſtand to your *Imaginations*, and *Suppoſitions*, (for ſuch all muſt be without the *Information* of Senſe) againſt the *Dictates* of *Senſation*, you muſt inevitably err.

But one may ſay, Is the Senſe at *Stomach* ſuch an infallible *Guide* always?

I believe it will be very hard to give many *Instances* to the contrary, and prove it well; however, if we do, or may allow ſomething of this *Kind* to a perverted *Stomach* at certain *times*, (to avoid a *ſquabble* about it) it is never to be allow'd, That all the *Stomachs* in the *whole World* ſhould be pleaſed with one and the ſame Thing at all times, and yet that this Thing ſhould be ſo highly pernicious to the *Animal* as to *diminiſh* or *diſable its Spirits*; Then, indeed, it would follow, that the moſt exquiſite Senſe at *Stomach*, to diſcern what is or is not agreeable to the *Animal*, were abſolutely in *vain*, which no Man of *Reaſon*, that has any Apprehenſion of the Wiſdom of *God* and *Nature*, can aſſert.

3. What is more notorious, than that *Pleaſure*, or being pleaſed, raiſes, and *Diſpleaſure*, or being grieved, depreſſes the Spirits? Are not all People *pleaſant, gay, and good humour'd, brisk, prompt, &c.* when pleaſed? Do not Men Travel, or Labour with more *Eaſe* in Pleaſant *Company, &c.* But of theſe Matters, and the Reaſons thereof, more in the following *Chapters.*

4. How can *Opium*, that revives *People* when they are ſo diſpirited that they are even almoſt dying, (as when *Opium* is wanted by ſuch as uſe to take it in *Deliquiums* and *Agonies* from *Pain, &c.*) *diminiſh, or diſable the Spirits?* It is plain *Contradiction* to ſay that it ſhould.

Next to *Opium*, nothing revives People in ſuch Caſes better than *Wine*, and thoſe Things that produce the ſame, or like Effects, have like *Nature*; and who can ſay that *Wine*, that was made to glad the *Heart* of Man, *diminiſhes or diſables the Spirits?* Or, that *Opium*, which produces all the *ſprightly, enlivening*, and *encouraging Effects* of *ge-*

nerous Wine, (in a more eminent manner than *Wine*, and in the 10000*th* Part of its *Quantity*, and for a *longer time* than *Wine* cauſes them) *ſhould diminiſh or diſable the Spirits?*

For *Inſtance*, *Wine* and *Opium*, in a due *quantity*, (but *Opium*, in a far leſs *quantity*, as was ſaid) cauſe a *pleaſant*, *gay*, *and good Humour*, *Courage*, *Bravery*, *Magnanimity*, *Promptitude in Buſineſs*, *Expeditenеſs in Management*, *Serenity*, *Euphory*, *or eaſy undergoing of Labour*, *Journeys*, *Fatigues*, &c. *Both* take away *Sadneſs*, *Grief*, *Melancholy*, *Fear*, *Depreſſion of Spirits*, &c. *Both* cauſe *Promptitude to Venery* (Sine Cerere & Baccho friget Venus:) *So* Wine *and* Opium *prevent and cure Cold*, *open the Pores*, *promote Perſpiration and Sweat*, *eſpecially the following Mornings*, as Sir *Theodore Mayern*, *my ſelf*, and *others*, have obſerv'd of *Opium*, and is notorious as to *Wine*. *Both* cauſe *Sleep*, and *take away the Senſe of Pain*, *and require a greater Doſe than ordinary in Proportion to the Pain*; *Both take off Shiverings from Fear*, *Cold*, *or Ague Fits*, *and cauſe Mirth*, *Contentation*, *and Acquieſcence*, *Drineſs of the Mouth*, *Thirſt*, *a Senſe of Heat within us*, *a Dreaming Condition*, *pleaſant Dreams*, (if the Quantity of *Wine* be not grievous by its *Heat*, *Load*, &c.) *Nocturnal Pollution*, and in ſome Conſtitutions *both* cauſe *Vigilancy*; but *Wine* and *Opium* cauſe that more rarely than *Sleep*: Both *ſtop*, *and cauſe Vomiting* if they ſtay too long at *Stomach*; Both *moderate Hunger*, (Λιμὸν σώρυξις λύει) and are good in a *canine Appetite*; Both cauſe *Swimming in the Head*, &c. So

Both in an Exceſſive Doſe,

Do cauſe, at firſt, *Mirth*, and afterward a kind of Drunken *Soper* in ſome, in others *Fury*, or *Madneſs*,

Madneſs, Sardonick Laughter, and *Weight at Stomach, Vomitings, Hiccoughs, great Heat at Stomach, Debility, and laxity of all Parts, Faltring of the Tongue, Scotomies and Darkneſs of the Eyes, Vertigo's, Laxity of the Cornea of the Eye, Dilatation of the Papilla, Deadneſs of the Eyes to the View, Loſs of Memory, Venereal Fury, a high Colour, profuſe Sweats, Purging ſometimes, Alienation of the Mind, Loſs of Memory*; and *laſtly*, greater or leſſer Effects according to the *Doſe, Conſtitution*, &c. So

A long and laviſh Uſe of both,

Cauſes *a dull and moapiſh Diſpoſition, Dropſies, Fall of Humours upon Weaken'd Parts, a Sleepy Diſpoſition, Want of Appetite, Weakneſs of Digeſtion, Aptitude* to *Sterility*, and *Abortion, early Decrepitaneſs, Stooping in the Back, Trembling of the Hands, Weakneſs of Memory, Shortneſs of Life, Difficulty and Danger in ſuddenly leaving them off, Revive ſuch as ſink for Want of either*, and *ſupply the Want of each other.*

How can any have the Face to ſay, that a Thing which agrees ſo with *generous Wine* in Effects, can be a *Diminiſher* or *Diſabler of the Spirits*? The Miſchiefs of exceſſive Doſes, and laviſh *Uſe* of either, is no *Argument* againſt their inſpiriting *Nature*; if it were, then *Wine* is no *Cordial*, tho' made to *glad the Heart of Man*, becauſe of its ill Effects laviſhly uſed: Therefore none can argue from that, that *Opium diminiſhes or diſables the Spirits*, any more than *Wine*, or *Bread* does, a Surfeit of which is moſt dangerous. *Omnis Repletio mala, Panis vero peſſima; & corruptio optimi eſt peſſima*: That is, *All Repletion is bad, but that of Bread is the worſt; and the Corruption of the beſt is the worſt.*

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The *ſhort* is this; *Wine* and *Opium* agree in all their *Effects*, ſaving ſuch as are Conſequences of their *different Accidents*, as the Quantity of *Wine* that muſt be uſed to cauſe the ſame *Effects* with a little *Opium*; and *Wine* having been fermented; and *Opium* (as may be ſhewn) having ſome *crude* and *viſcid Roſin* in it, which ſometimes ſticks to the *Cruſta carnoſa*, *&c.* of the Stomach; whence it happens, that *Wine* loads one more, heats more, and is more troubleſome upon thoſe *Accounts*, and that *Opium* offends the *Stomach* oftner even in a moderate Doſe, cauſing *Vomitings*, *Hiccoughs*, *Anxieties*, *Diſtreſſes* at Stomach, *Deliquiums*, *&c.* becauſe of the *indigeſtible Roſin* ſticking to the ſides of the moſt ſenſile *Stomach*, as I ſhall farther prove hereafter, (by *God's Help*) ſhewing very eaſie *Ways* and *Means* to ſeparate that *Roſin*, and ſo make it as ſafe, and leſs troubleſome, as it is more effectual than *Wine*.

Opium cannot *diminiſh or diſable the Spirits*, becauſe (as has been proved) it ſends no *Part*, *Fume*, or *Effluvium* to the *Brain*, or *Animal* Spirits, to cauſe ſuch bad Effects while it is at *Stomach*, yet does it produce them while it is there; for, as the *Vaporarians* themſelves (and indeed all Men) allow, there can be no *Deſtruction* without *contact*.

Sanctorius doth well and truely obſerve, by the Help of his *Staticks*, that nothing cauſes *liberal Perſpiration*, but it raiſes the Spirits; it is moſt certain, that nothing in Nature opens the *Pores*, and cauſes *Perſpiration*, more than *Opium*; Therefore nothing ſhould, according to his *Obſervation*, elevate the Spirits more, and, indeed, nothing does, as appears by all that has been ſaid, and will yet more plainly appear.

Loſs

Loss of Memory by *Opium* (as some argue) is not so much a *Loss* of *Spirits*, as *Laxity* of the *Brain*; for People in Drink do not want Spirits, but there is a great *Relaxation* of the *Brain*, and its *Membranes*, and of the whole *Genus Nervosum*, which *Relaxation* causes a soft, loose, and labile *Brain*, that like Liquid Things retains no *Impression*; besides, that I shall (*God willing*) shew you hereafter, that Impressions cannot be so well made upon the *sensitive Soul*, by the *Animal Spirits*, upon *Relaxations* of the Sensible Parts, as in *Sleep*, *&c.* for a very plain *Mechanical Reason* to be shewn in due *time*.

Thus have I, (by the *Assistance* of its *Maker*, who best knows it) cleared *Opium* from the *false Aspersions* of an extreme *Cold Quality*, and *Narcotick Fumes*, both which were commonly call'd *Venemous*, *fatal*, and by all the *ill Names* imaginable, but (as good Luck is) they abused nothing; because 'tis manifest, that there is no such Thing, nor has it any Quality by which it *diminishes*, *or disables the Spirits*, as is most evident from the *Premises*, so that all that has been said of *Opium*, by way of *Hypothesis*, to explain its Effects, depending upon its *diminishing or disabling the Spirits by a Cold Quality*, or *Fumes*, is come to nothing. I wish it had been as innocent.

CHAP.

CHAP. XII.

Shews what must be the true Cause of the Operation of Opium.

ALL the *general Foundations* upon which *Authors*, either *Ancient* or *Modern*, erected their several *Hypotheses* concerning the *Operation of Opium*, having (as manifestly appears) no real *Existence*; What *Enchanted Castles* in the *Air*, or *vain Phantasms*, must their Structures be? And, how like *deluded Wizzards* must they appear, while they seem'd to take *high Flights* and *glorious Prospects* of Causes that had no *Reality*?

Thus am I left utterly distitute of either *Foundation* or *Model*, unless I find out *that*, and frame *this*; which (I hope) may be easily done, because (the *cloudy Supposition* of *Vapours* having vanished away) there now remains but Two Ways by which an *Internal Medicament* can Operate, *viz.*

1. *As an Alterative of the Blood*, &c. Or,

2. *As affecting the Sense of Feeling*, either *grievously*, as *Vomits*, *Purgers*, &c. Or *pleasingly*, as *Cordials*, *generous Wines*, *titillating Amphrodisiacks*, *comfortable Warmth*, *Anodynes*, and such like, that please the *Nerves* and *Membranes*; which way of Operating is too little observ'd by *Physicians*, tho' they take great *Notice* of the *Operation* of Things by *grievous Sensation*, as *Irritatives* to *Vomit*, *Purge*, *Salivate*, *&c.* by their *Acrimony*; whereas the *Pleasers* of *Sensation*, which must, as *Contraries*, have *contrary* Operations, are little regarded, or thought of.

I. Opium

1. Opium *does not Operate as an Alterative of the Bloud*, &c.

First, Becauſe it Operates while it is at *Stomach*, or (*at leaſt*) before it arrives at the *Bloud*; which manifeſtly appears ſeveral *Ways*; as,

1. Becauſe it often Operates in a *Liquid Form* in few *Minutes*, and very commonly in a *Quarter* of an *Hour*, in which time it muſt be at *Stomach*, or, at leaſt, far from arriving at the *Bloud*.

2. Becauſe it has been very often Vomited up after it has Operated, and produced its *uſual Effects* for 1, 2, 3, 4, 5, 6, 8, 10, and ſometimes more *Hours*; as evidently appear'd by the *Smell*, *Colour*, *Taſte*, *&c.*, of what was Vomited; and by its *Operation* ceaſing after ſuch *Vomiting*; of which *common Experience*, and *Authors*, do inform us: See *Helmont Jus Duumvir.* 62. where he tells of *Opium* Operating at Night, and Vomited up next Morning.

3. Its bare cauſing Vomiting after it has Operated for a good while, is of it ſelf (tho' its *Taſte*, *Smell*, *&c.* did not diſcover it) an infallible Argument of its Operating, while it is at *Stomach*; for 'tis againſt all Reaſon to imagine, that Things ſhould irritate it to Vomit after they are gone into the *Bloud*, and not do it while they are in the *Stomach* it ſelf, as all *Vomitories* do.

The Reaſons why it ſtays ſo long at Stomach, are, 1. Its *Indigeſtibleneſs*, which plainly appears by *Stools*, *Urine*, and *Sweat*, ſmelling of it, when taken in any conſiderable Quantity; all the *Coctions*, *Digeſtions*, *Circulations*, *&c.* that it paſſes in the Body, ſignifying very little to it, which its cauſing *Itchings* in the Skin, and affecting the *Ve-*

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nereal Membranes after its paſſing the Bloud, do alſo argue. 2. The clamminess of its reſinous Parts ſticking to the *Stomach*, cauſe (as I ſhall plainly prove hereafter) its long ſtay in it; for if the *Roſin* be ſeparate from it, 'twill not then make ſuch a long ſtay at Stomach, as I have often Experienced.

4. We actually feel it cauſing a ſenſe of *Pleaſure* at Stomach during its Operation, therefore it is then in it.

5. It has been carried off by Stool after it has produced its uſual Effects; Therefore it Operated before it arrived at the Bloud.

6. All Obſervers do allow, that *Opium* Operates while it is at *Stomach*; which gave the Occaſion (as you may remember) to the *Hypotheſis* of its Operating by *Fumes* riſing out of the *Stomach*; becauſe they could not think of any other Means by which it might affect the *Head*, *Brain*, *Animal Spirits*, *Nerves*, *&c.* while it was at *Stomach*, but by the Way of *Fumes* or *Vapours*.

It is therefore paſt all doubt, *That* Opium *produces its common Effects while it is at Stomach, and before it arrives at the Bloud, and therefore does not Operate as an Alterative thereof.*

Secondly, Becauſe a *Grain* of *Opium*, which Operates very remarkably, bears (as *Etmuller* well obſerves) ſo ſmall a Proportion to the Bloud, that it cannot produce ſuch great, and notable Effects, as an *Alterative* thereof; for a Grain of *Opium* to 20 Pound of Blood, (which an ordinary Man has in his Body) is but as 1 to 115200, or (if 16 Ounces be allow'd to the Pound) as 1 to 153600. But it is no Wonder if a *Grain* ſhould affect the *Membrane* at *Stomach*, ſince the

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1000 part of a *Grain* of the *Vomitory Particles* of *Crocus Metallorum*, or *Regulus* of *Antimony*, does affect it so eminently, as many other Things will in a very small Quantity; whereas the altering of the Blood to any observable *degree*, requires the Use of *Alteratives* in great Quantity for several *Weeks*: Which confirms the former Conclusion, *That* Opium *does not Operate as an Alterative*, as to its common and usual Effects.

II. Opium *does not Operate by grievous Sensation*, (or Irritation) as *Vomits*, *Purgers*, *Errhines*, *Salivators*, (or Apophlegmatizers) *&c.* do.

First, Because it manifestly causes a very agreeable, pleasant, and even charming *Sensation*.

Secondly, Because it takes away *grievous Sensation* or *Pain*, thereby stopping *Vomiting*, *Purging*, and all other Effects of *grievous Sensation*, by *Acrimony*, *&c.*

As for the *Vomiting* that *Opium* sometimes causes, it is only *(as shall be shewn)* by its Resinous Parts sticking to the Coat of the *Stomach*, which being separated from it, *Opium* has no such *Effect*, tho' all its *good Effects* remain. So its *Purging* (which happens most rarely, and only when a great *Quantity* is given to Men of strong Digestion) it is only from its Rosin digested, and resolved in strong *Stomachs*; Hence it is that *Dogs*, and such as have *canine Appetites*, do generally Purge after a great Quantity of *Crude* or *Resinous Opium*; whereas such as is not *Resinous* causes no such *Effect*. But of these Matters more to your Satisfaction hereafter.

Thirdly, Because it causes all Effects that are quite contrary to those of *grievous Sensation*; *It* causing

cauſing an *Ovation* of the Senſitive Soul and Spirits; *Pain* (or grievous Senſation) a *Depreſſion of Spirits*; *It* cauſing *Euphory* and *Pain*, *Wearineſs*; For what tires more than *Pain*, or labouring in *Pain*? *It* cauſing *good Humour*, *Pain Peeviſhneſs*, *Fretfulneſs*, and *ill Humour*; *Opium* cauſing Relaxation of all Parts, *Pain* Contraction; *That* cauſing free *Perſpiration*, *this* checking it; *That* cauſing Sleep, *this* hindering it; *That* cauſing Contentation Acquieſcence, *this* Diſcontent and Uneaſineſs; *That* compoſing, *this* diſcompoſing the *Spirits*, *Bloud*, &c. *That* cauſing *Fluxes* by *Irritation*, &c. *this* moderating, or ſtopping them; *That* opening the Pores, *Pain* conſtringing them; *Opium* preventing the Shaking Fits in *Agues*, *Pain* bringing them on; *That* cauſing a large and ſlow Pulſe, *this* a quick, hard, and narrow Pulſe; *That* cauſing an *Efflorescence* of the Skin, *this Paleneſs*; *That* pleaſant, *this* unpleaſant Dreams; *That* ſtills Hiccoughs, *this* cauſes them; *That* takes off *Contractions*, *Convulſions*, &c. *this* cauſes them. To be ſhort, *Opium* cauſes all the Effects of *pleaſant Senſation*, and takes off all the Effects of *grievous Senſation*. What can be a more evident Proof of its acting by cauſing a *pleaſant Senſation*? It were endleſs to mention all the *Proofs* that may be made to the ſame Purpoſe, from *Pleaſers* and *Diſpleaſers* of *Senſation*.

Therefore we fairly conclude,

That Opium *does not Operate by cauſing a grievous Senſation*, and there being no other Way left by which it may Operate,

It muſt Operate by cauſing a pleaſant Senſation; which is the *true* and *plain Reaſon* why (as has been ſhewn) it takes off *Pain*, and cauſes all Effects quite contrary to that of *grievous Senſation*;

Irrita-

Irritations by Acrimony, &c. which are most eminent upon the most sensible Parts, as the *Stomach*, *Intestines*, *Ventreal Membranes*, *Skin*, &c. as you may observe where the Effects of *Opium* are enumerated.

Now *(gentle Reader)* consider, That *Contraries* are the true Cure of *Contraries:* What can then cure Pain, and all its Effects, better than *Pleasure?* 'Tis very strange then, that *Millions* for many Ages finding *Opium* cure, or take off *Pain*, and all its Effects, above all Things, should not attribute its so doing to its causing a *pleasant Sensation*, which is the direct contrary to *Pain*, especially since every Man that took *Opium* felt an *actual Pleasure* upon taking thereof, *pleasant Dreams*, a *pleasant Humour*, &c.

It may be said, What if it be granted, that *Opium* Operates by a *pleasing Sensation*, (which I will Thank none for, that have *Feeling* at *Stomach*, or *Reason* at *Brain*) how is it possible that such *pleasant Sensation* should cause and explicate all the *various*, *strange*, *wonderful*, *mysterious*, and very often *seemingly contradictory Phenomena's* and *Effects* of *Opium?*

Answer. As easily as ever I explain'd any Thing in Nature, especially if my *Tract* of *Animal Mechanism* were published; but it is my *Misfortune* that it is not, however it shall not be the *Readers*, tho' it will put me to a great *Trouble*; To evade which, is none of my *Intention*, by *those Words*, but rather to bespeak the *Reader's Patience* while I am premising some necessary *Præcognita* requisite to be known before I enter upon the *Explication* of the wonderful and seemingly inexplicable *Effects* of *Opium.*

I therefore deſire the *Reader's Leave* to premiſe ſome Things of the *Nature* of *Senſation*, and *ſenſitive Pleaſure*, in order to his more clear and ready Underſtanding my Explication of this *Myſterious* and *Momentous Matter*, look'd upon as ſo dark and abſtruſe a Buſineſs to this day, that ſome have not only yielded it up as a Thing hidden from Mankind, but have earneſtly and ſeriouſly argued, that it acted abſolutely by an *occult Quality*, reſerved in a ſpecial manner (as is the Nature of Spirits) from our *Knowledge*.

That it has been ſo hitherto, I think none can deny, as the *Circulation* of the *Bloud* was for *Thouſands* of *years*, tho' the very *Motion* was *ſeen* by *Millions*; ſo as the Cauſe of the *Operation* of *Opium* has been felt by a far greater number, it therefore will (if I fail not in explaining it) appear ſo clear, that it will be much wondered at (like that of the *Circulation of the Bloud*) why ſo obvious a *Thing* was not found by every one that uſed *Opium*. But (whatever *Opium* is) God's Methods are unſearchable, and often his Wiſe Providence beſtows good Gifts upon the Unworthy, that his free *Goodneſs* may appear; To whom be all *Glory*, *Praiſe*, and *Thankſgiving* for ever and ever. *Amen*.

Note, That while I am upon the Preparatory *Diſcourſe* about *Senſation*, *Pleaſure*, *&c.* in the following *Chapters*, you may ſometimes wonder what I would be at, becauſe you may not perceive the *Drift*, yet do they require your *Attention* as being the *Foundation* of all that is to follow; which you'll plainly perceive afterward, when (I hope) you'll have good *Satisfaction* for your *patient* and *attentive Peruſal* of the Two following *Chapters*.

CHAP.

CHAP. XIII.

Of the Oeconomy of Senſation, as far (at leaſt) as it concerns our preſent Purpoſe.

WHEN I had written this *Tract* thus far, I judged it beſt, firſt, to publiſh that of *Animal Mechaniſm*, becauſe it contained thoſe *Principles* that would explain the Matter of *Opium*; therefore laying this aſide, I applied my ſelf to that: But a *New Art*, rightly to *Spell*, *Write*, and *Sweeten* all *Languages*, (that I ſince call'd *Phonography*) coming into my Mind, and thinking it might be very uſeful, and likely to lie for ever in Darkneſs, (as it had always been) unleſs I undertook the *Drudgery*, I ſet my ſelf to it; which taking up more *Time* than I imagined, has to this *day* hindred the finiſhing of that *Tract* of *Animal Mechaniſm*, which I now much want, (as was intimated:) Therefore becauſe I reſolv'd to publiſh this, (that was ſo long ſince promiſed) I am now forced, for want of that *Book*, to premiſe here ſome Things, concerning the *Oeconomy* of *Senſation*, and the *Nature of ſenſitive Pleaſure*, in order to explicate the *Effects* of *Opium*, which might have been ſpared, if that of *Animal Mechaniſm* had been publiſhed.

Conſidering that *Opium* muſt (as was ſhewn) operate by pleaſing the *Senſe* of *Feeling*, it will be requiſite to conſider,

1. *The Oeconomy of Senſation, as far as it concerns the preſent Purpoſe*, for which this *Chapter* is deſign'd.

2. *The Nature of sensitive Pleasure, and its Effects upon the sensitive Soul and Body*, which is to be the Subject of the following *Chapter*.

Five Things mainly concern the *Oeconomy* of *Sensation*: 1. The *Object*. 2. The *external Medium*. 3. The *Organs* of *Sensation*. 4. The *Animal Spirits*, (or *internal Medium*.) 5. The *sensitive Soul*.

1. The *Object is the Thing perceiv'd by any of the Senses*; as, *Light* by the *Eye*; *Sound* (or *tremulous Motion* of the *Air*) by the *Ear*; *Odour* by the *Nose*; *Tastes* by the *Tongue*; *Opium* by the Feeling, or (as *Helmont* calls it) the *Gustus* (or *Taste*) at *Stomach*.

2. The *External Medium of Sensation is that which receives Impressions from the Object, and conveys them to the Organs of Sensation*. Thus the *Air* conveys *Sound* (or *tremulous Motion*) to the *Ear*, *Light* to the *Eye*, and *Odour* to the *Nose*.

3. The *Organs are the Parts of the Body that God hat fram'd to receive those Impressions, and communicate them to the Animal Spirits*, (or *Internal Medium*.) Thus the *Eye* is the *Organ* to receive the Impression of *Light*, the *Ear* that of *Sound*, &c. And the *Membranes* in all Parts of the Body are the *Organs* that receive *Impressions* from *Objects* in the case of *Feeling*, which is our main Concern.

4. The *Internal Medium is the Animal Spirits that receive the Impressions from the Organs, and convey them to the Sensitive Soul*.

5. The *Sensitive Soul, which perceives those Impressions convey'd to him by the Animal Spirits*; which *Perception* is *Sensation*.

I. *The*

1. *The Part, Office, or Business, of the Object, in the Matter of Sensation, is to make a sufficient Impression either upon the External Medium,* (or *Air*) as in the case of *Hearing, &c. or immediately upon the Organ,* (or *Membrane*) as in *Feeling, &c.* Therefore if there be no *Impression* of *Light, Sound,* (or *tremulous Motion*) *Odours, Relishing Particles, &c.* there can be no *Perception*; or if the *Impressions* thereof be weak and faint, the *Perception,* or *Sensation,* must be accordingly; or if it be so inconsiderable, that it cannot at all affect the *sensitive Soul*, then is there no *Perception* thereof. For,

1. *Sensitive Perception is not infinite,* because there are Degrees of *Light, Sound, &c.* that cannot be perceiv'd, tho' they must be very small, and inconsiderable: Thus the Light of a Candle at so great a *distance* that it can hardly be perceived, is some *Degree* of *Light*, and makes its Reflection proportionably from a *Wall, Tree, &c.* yet cannot that reflected *Light* from the *Wall,* or *Tree,* be perceived; so the smallest Things cannot be perceived. Yet GOD has in His *Wisdom* and *Goodness* so ordered it, that,

2. *Sensitive Perception is of excessively small Things:* Thus the *Sound* of a Pin's Head, falling into a Brass Caldron, is heard at some distance; the hundreth part of a Grain of very hot and biting Things, are sensibly tasted; the thousandth part of a Grain of *Ambergrise, Musk, &c.* very sensibly smelt; the Light of an exceeding small Spark, struck out between *Steel* and *Flint*, is perceived at a great distance: And *Light* in general consists of such tenuious Particles, (if material) that none ever could take any estimate of their Bulk. So the *Feeling* at *Stomach* takes very eminent and remark-

able notice of (as was ſaid) the *Vomitory Particles* of *Crocus Metallorum*, or *Regulus of Antimony*, which are ſo ſmall, that a *thouſand Vomits* thereof does not ſenſibly diminiſh the *Crocus*, or *Regulus*, either in *weight* or *bulk*. Therefore it is no Wonder if a *Grain* of *Opium* ſhould affect the *Feeling* ſo ſenſibly as it does, eſpecially at *Stomach*, tho' it cannot make any conſiderable *Alteration* of the *Bloud*.

3. *That whatever affects, or makes impreſſion, upon the Organs of Senſation, is in the ſame moment perceived by the ſenſitive Soul*: So that it is no Wonder, that a *Grain* of *Opium* operates in ſo ſhort a *time*, that is, as ſoon as a *Tincture* thereof inſinuates it ſelf through the *Cruſta Carnoſa* to the *ſenſile Coat* of the *Stomach*; whereas it muſt take a very long time, if it operated as an *Alterative* of the *Bloud*.

Now *Note*, 1. That there is no *way* for any thing to operate upon the *ſenſitive Soul*, in ſo ſmall a Quanty, as *Opium* operates, or in ſo ſhort a Time, as by affecting the moſt exquiſitely diſpoſed *Membrane* at *Stomach*. 2. That the ſpeedy *Way* that *God* has contrived for our *Refreſhment*, *Comfort*, *raiſing* of our *depreſſed Spirits* upon any ſudden Occaſion, as in *Deliquiums*, *Faintings*, *Syncopes*, *Leipothymies*, *&c.* is by the *Senſes*; eſpecially that moſt exquiſite Senſation at *Stomach*, becauſe *Refreſhment* by Nouriſhment and *Alteration*, cannot be perform'd but in a long time, wherein we might in many *Caſes* periſh before we could be relieved thereby: Thus a pleaſing, and therefore comfortable *Odour*, excites the Spirits in a moment; the ſight of a beloved Miſtreſs, or dear Friend, raiſes us immediately, when we are moſt caſt down; as does alſo *ſweet Melody*, and an aggreeable or pleaſant *Senſation* at *Stomach*, as

of

of *Wine*, *Cordials*, *hot Spirits*, *&c.* I hope none will ſay, That Muſick, the ſight of a Bag of Money, *&c.* ſend *Effluvia's* for that end, yet are great Comforters.

II. *The Part, Office, or Buſineſs, of the External Medium, in the Oeconomy of Senſation, being to receive and convey Impreſſions,* as *Sound* (or *tremulous Motion*) from a *Bell* to the *Ear*, *&c.* it muſt be duly qualified for that purpoſe.

It is true, that we are not concerned as to this *external Medium* (or Air) in our Caſe, becauſe *Opium* affects only our *Feeling internally*, and immediately at *Stomach*, where it touches the very *Organ*, (or *Membrane:*) However, becauſe this *External Medium* (or *Air*) is to receive and convey *Impreſſions* after the ſame manner, from the *Object* to the *Organ*, as the *Internal Medium* (or *Animal Spirits*) is to receive them from the *Organs*, and convey them to the *ſenſitive Soul*, and therefore bear exact *Analogy* to each other; and becauſe the *External Medium* (or *Air*) is more obvious than the *Internal*, (or *Animal Spirits*) I think it very convenient to conſider its *Diſpoſitions* and *Requiſites*, as a *Medium*, that we may the more clearly perceive thoſe of the *Animal Spirits*, as ſuch.

1. *It is requiſite that the Air, as a Medium, (being a fluid Body) ſhould be ſpringy,* (or *elaſtick*) becauſe nothing but what is ſo is capable of *tremulous Motion*, (which is *material Sound*) nor of *Compreſſion*, without which, a looſe, tenuious, yielding *Fluid*, as the *Air* is, cannot be fit to convey *Impreſſions*; for the more *ſolid* any thing is, the fitter it is for that end; therefore *Compreſſion* muſt render it *firm*, *tight*, and *cloſe*, that one Part may briskly communicate its *Motion*, or *Impreſſion*, to

the next to it, and that to the next to it, and ſo indefinitely; yet can it never arrive at the Perfection of a *Solid* in carrying of *Impulſes*: Hence it is that *Sound* decays by *degrees*. However, it has many great *Advantages* over a *Solid*, as a *Medium* for the purpoſe of *Senſation*:

Firſt, Becauſe it receives *Impreſſions* better.

Secondly, Becauſe a Solid having *weight*, could not be ſo eaſily moved, in order to convey the *Impreſſions*.

Thirdly, Becauſe there would be no living or being in a Solid, as there is in the *Air*.

Fourthly, Becauſe if moved, *&c.* it would deal very rudely, grate and tear the very *Organs*, and not gently touch them, as the yielding *Air* does; beſides many other Inconveniencies, which to mention is to little or no purpoſe. So being *fluid*, *tenuious*, *yielding*, &c.

2. *It is* (as was intimated) *requiſite*, *that it ſhould be compreſſed*, for the better conveyance of *Impreſſions*, the more the better; for then (like a *Gut* blown very tightly) a ſmall *Impreſſion* cannot be made upon one part thereof, but it is communicated a good *way* to other Parts: But if not compreſſed, you may compare it to a *Gut* half full of *Air*, or a looſe ſoft Lock of *Wooll*, that yields, and will not convey *Impreſſions* at all, or very faintly; whereas if the *Air* be tightly *compreſſed* in a *Gut*, *&c.* you cannot make a little *Impreſſion* (or *Dent* thereby) at one *end* of it, but the whole *contain'd Air*, having leſs room by ſo much, becomes more compreſſed, and conſequently thruſts ſo much the harder againſt all the *ſides*, and the farther end thereof, eſpecially if the *Gut* has no *vent*, or that it be not too wide; for, in the *firſt Caſe*, the *Air*, that ſhould be kept in for the *communication* of the *Impreſſion*, having

having Liberty at the *Vent*, takes its courſe that way, and ſo diſappoints the continuation of the *Impulſe*, (or *Impreſſion*) either wholly, or in great meaſure; In he *ſecond Caſe*, the *Impulſe* bearing but a ſmall *Proportion* to the whole, and alſo decaying in *Proportion* to the *Liberty* it has to widen, becomes much more inſenſible, or leſs remarkable.

Thus if you make a *Dent*, or *Impreſſion*, of the bigneſs of half a ſmall *Pea*, at one end of a *Gut* ſo filled with *Air*, that is of the bigneſs of one's Thigh, and two Yards long, it will bear a very ſmall *Proportion* to the whole, and conſequently very inſenſibly affect it; for 'tis like a *Drop* (as the Saying is) added to an *Ocean*; but if an *Impreſſion* (or *Dent*) of that *bigneſs* be made upon a *Gut* no bigger than a *Pea* in *diameter*, the *Thruſt*, or *Impreſſion*, will be very conſiderable at the other *end*, for the Reaſons aforeſaid. So that you plainly ſee, 1. That the more *Air* is compreſſed, the better it conveys *Impreſſions*: Hence it is that we hear *Sounds* better, and farther, when the *Air* is moſt compreſſed, and the *Quickſilver* high in the *Barometer*, (or *Weather-glaſs*) and upon low Grounds, tho' flat, and without any *hollowneſs*, than on the *tops* of high Hills that are flat alſo; becauſe the *Preſſure* of the *Air* is leſs on high Hills. I mention the *Flatneſs* in both Caſes, leſt any ſhould attribute it wholly to the more free *Expanſion* of the *tremulous Motion* on the tops of Hills, which indeed is a *Reaſon* where the *Flatneſs* is not alike, as far as the *Sound* goes. 2. That the narrower the *Gut*, *Duct*, or *Pipe*, the *Air* is in, the ſmarter and more ſenſible will be the *Impreſſion* at the farther *end* thereof, which may be confirmed and illuſtrated by many *Demonſtrations*, *Inſtances*, and *Experiments*.

Hence

Hence it is, That if one speaks at one end of a *Pipe*, that is but an Inch in *diameter*, you'll hear it much better at the other *end* than in a *close Gallery* of the same length, tho' this will advantage it much more than the open *Air: That* if one speaks ever so slowly at one *end* of a long Piece of Timber, it is manifestly and distinctly heard at the other *end*, through the narrow *Vessels*, and between the Fibres of the *Wood: That* all *Sounds* are *sharper* in *narrow Pipes*, *&c.* How easie is it then to contrive invisible *Whispering-Places*, which the World so much admire, and some *Religions* make such great *Use* of to deceive the People by pretended Divine and Oracular *Responses*, of which the *Reader* may hereafter be aware.

It is for like Reasons that *Guns*, *Bells*, *&c.* are better and farther heard along hollow *Valleys*, than upon *Plains*; that *Sounds* are heard so well the ways that *Rivers* run; for it is a *vulgar Error* that the *Water* does advantage the *Sound* upon *Rivers*; if it did, you'd hear farther at *Sea* than upon *Land*; which is so false, that the quite contrary is true, *Sounds* being much farther heard by *Land* than at *Sea*. It is a common Observation in *Sea-Fights*, that the *Sound* is heard at a much greater distance upon the *Land* than at *Sea*.

There is indeed another *Advantage* in *Valleys*, (and therefore upon *Rivers*) *viz.* the several *Reverberations*, or *Eccho's*, from the *Hills* and high *Banks*, *Rocks*, *&c.* on the *sides* thereof; but this not much concerning our Purpose, I must (for the present) pass them and several *Observations* upon *Sounds*.

For the aforesaid, and other *ends*, it is notorious that the *Air* is *springy*, and always under the *compression* of the *Atmosphere*, or else it would be of little *use* as a *Medium*.

I know but one thing more to our Purpoſe that is worth the mentioning, in reference to the *Analogy* between the *Air* and *Animal Spirits*, as *Mediums of Senſation*, *viz.*

3. *It is requiſite, or convenient at leaſt, that the Air have an homogeneous Continuity*, which much more advances it in conveying *Impulſes*, (or *Impreſſions*) than when it is diſcontinued, divided, or ſever'd, by other *heterogeneous Particles*, eſpecially if theſe be in motion between the Parts of the *Air*; for then they very much diſappoint and diſgregate the *Impreſſions* made thereon.

Therefore it is, that we hear ſo much better after *Sun-ſet*, or in the *Nights*, eſpecially the *Summer-time*, than in the *Day*, when the *Particles* of *Heat*, and others thereby raiſed, do too much divide, diſcontinue, and diſgregate the *Impreſſions*, and the Parts of the *Air*: Where you may obſerve how Good and Wiſe *Providence* orders Hearing to be more uſeful in the Night, when Seeing fails. It is a vulgar *Errour*, (tho' little thought ſo to be) That the Cauſe of the Difference of hearing Sounds *before* and *after Sun-ſet*, is the *Noiſe* that is made in the *Day-time*, and the Silence of the *Evenings* and *Nights*; which one ſingle Inſtance (tho' thouſands may be given) will fully demonſtrate, *viz.*

In the Famous and Well-governed *Univerſity* and *City* of *Oxford*, there is ſcarce any *Noiſe* made at the Times of *Divine Service* on the *Lord's Day*, all People being either ſilent at Church, or ſhut up quietly and ſilently in their reſpective *Houſes* or *Colleges*, (the *Heat* of the Days in Summer-time, but moſtly the good Order of the Place, cauſing it:) But after *Sun-ſet*, moſt People are out, walking and diſcourſing, or talking at their *Doors*, *Arbours*, or *Gardens*; and all Children

dren (that noiſie Part of Mankind) are now permitted to go out, who act their Parts in *Playing*, *Running*, *Calling*, *Yawling*, and *Crying out* one to another; inſomuch that (all things conſider'd) I cannot imagine but there muſt be in general an hundred times more Noiſe made then, than in the the time of *Divine Service* in the *Heat* of the *Day*; yet may you, notwithſtanding all the *Noiſe*, hear, in the *Twilight*, any thing twice as far as in the time of *Divine Service* in the *Heat* of the *Day*, (I believe I might have ſaid four or ſix times as far.) The ſame may be obſerv'd in any *Town* or *City* that is kept in good Order at the time of *Divine Service*, or in *Camps*, &c. upon ſeveral Occaſions.

It is not only conſonant to Reaſon that the *Air* ſhould be ſo diſcontinued by the Particles of *Heat*, *&c.* but obvious to the Sight that it is ſo; for in a great *Heat*, the Summer-time, and cleareſt *Day*, you may ſee the very *Air* in a wavering tremulous Motion, which could not be ſeen of it ſelf, without the mixture of other *Parts*; for diſgregation of Parts, (as you ſee even in pellucid homogeneous Things powder'd) cauſes Opacity.

III. *The Buſineſs, or Office, of the Organs of Senſation, in the Oeconomy thereof, being to receive and communicate the Impreſſions to the Animal Spirits with all the ſmartneſs they can*, it is manifeſt, that in the *Membranes*, (or *Organs*) *Tenſion is their main Requiſite*. Hence it is that when the *Tympan* of the *Ear* is tenſe, the *Cornea*, and other Tunicles of the Eye ſufficiently ſo, we hear and ſee acutely and accurately; to that end *God* has given us a *Power* to render the Tympan more tenſe when we liſten; to contract the Pupilla of the Eye when we look very intently, *&c.* And we ſee, that when the

Cornea

Cornea is relaxed, (as it is always when the Eye looks deadish, as in *Sleep*, *Drunkenness*, *fainting Fits*, *&c.*) yet then we either not feel at all, or much worse: So it is when the *Tympan* is relaxed. We also always put the *Tongue* in a *tense* condition, when we would taste a Thing exactly. So when any Part is relax'd by Warmth, *&c.* we do not feel so well and nicely, as when the Part is cold, or more tense, or rigid; nor in *Sleep*, as when *awake*, because all Parts are relaxed in *Sleep*, and contracted when we are awake, which manifestly appears,

1. Because we perspire less when we are awake, than when asleep, which happens because the Pores are closed by the *Contraction*, or *Constriction*, when we are awake, and opened, or loosened, by *Relaxation* when asleep. In all *Relaxations*, as that which happens by *Pleasure*, *Warmth*, *Leipothymies*, *Sleep*, *&c.* we perspire *more*; and *less* in Contradictions, by *Cold*, *Fear*, *Grief*, *Pain*, or any *grievous Sensation*, or *Passion*.

2. Because all Parts are firmer when we are awake, and more loose and flaccid when we are asleep; none can doubt but Firmness is from *Tension*, or *Contraction*: But in this *matter* you may expect farther *Satisfaction* by and by.

Obj. Some may needlesly say, How came *Tension* and *Contraction* to be Concomitants, or *Effects* one of the other, seeing we make Things more *tense*, as a Drum's Head, *&c.* by *Extension*, not *Contraction*?

Answ. I purposely started this *Objection* to clear the *Case*. Therefore, 1. Observe, That *Violin-Strings* will grow so tense (as will any thing else of like *Nature*) by *Contraction* in moist Weather, that

that tears them to pieces ſometimes upon that account, and always puts them upon a greater ſtreſs; for when a thing is fixed at both *ends*, it is the ſame thing to ſhorten, or contract, the String, to render it *tenſe*, as to take ſomething from its length between thoſe two fix'd Points; both the *Contraction* and the *Winding* do only take ſomething of the Length away, that is between thoſe two Points, where the Ends are faſtned; which cauſes a great ſtreſs of the ſhortned String, to reach thoſe two Points that it is faſtned to: As, ſuppoſe you have a String of 11 Inches long, faſtned at both ends at the diſtance of 10 Inches, it will be very looſe; then ſhorten it one Inch, by winding up ſo much, or by ſome means contract the String to 10 Inches, or any way ſhorten it an *Inch*; then it will juſt reach the Points, and be tenſe, if faſtned at them. So there is *Contraction* neceſſarily cauſing *Tenſion*, which was to be *demonſtrated.*

It will be the ſame in effect, if a String put round any thing is ſhortned by Moiſture, or otherwiſe, it muſt grow more tenſe; and ſo muſt 500 Strings, if ſo ſhortned, or an entire Membrane that covers or includes the whole. Thus Membranes (as a Gut contracted upon included Air) muſt, when they contract, grow more tenſe upon the included *Animal Spirits* in the *Nerves*, or otherwiſe; for it is the ſame as forcing much Air into a narrow, or contracted Gut, or Bladder, which muſt make them *tenſe*, while the elaſtick Body muſt thruſt out the harder, the more it is compreſſed. And that the Membranes, and all ſenſile Parts, are more contracted when we are awake, doth farther moſt plainly appear: Becauſe,

3. The

3. The *Cornea* of the *Eyes* (which is a visible and certain sign of the *Relaxation* of all the *sensile Parts* of the *Body*) is relax'd in Sleep, as any one may see; for that is the cause of the deadness of the Eye in *Sleep*, which upon awaking is immediately gone, by the *Cornea* contracting into a tense condition upon its *Contents*, by which means it becomes *tense*, *rotund*, *hard*, *smooth*, *shining*, and reflects a brisk *Speck* of Light, (as round Things do) which makes it look lively; whereas when 'tis lax, as in *Sleep*, *Syncopes*, *Faintings*, *&c.* it is uneven, soft, and reflects an uneven, dull, indefinite Light, all which causes the deadness of *Looks*. Therefore (as was intimated) there is no better sign of *Relaxation* than deadish Looks.

4. The *Pupilla* (which is another sign of *Relaxation*) is relaxed, or dilated, in *Sleep*, and contracted when we are awake.

5. All Motions of the *Body* are better performed when we are awake; which argues the greater *contraction* of Parts; for *Relaxation* (as in *Sleep*, *Deliquiums*, *Drunkenness*, *&c.*) weakens all *Motion*.

6. That *Efflorescence* of the Skin which People have when asleep, (which is caused by the *Relaxation* of the *Skin* admitting the Bloud more into it; as *Paleness* is by the *Contraction* of the *Skin* in *Cold*, *Fear*, *&c.* repelling the Boud) disappears upon awaking, by *reason* that the *vigilative Contraction* (so I call it) does send the Bloud out of the Skin by squeezing it back, or repelling it.

7. Measure the Body ingeniously and accurately, and you'll find it contracted and narower, after *awaking*, than in *Sleep*.

8. Hence it is that you find, when the *Body* is pretty full of *Moisture*, and the Weather hot, a sudden *Sweat* upon awaking; because the whole

Body

Body contracting, does, like the contortion of wet Linnen, cauſe an exudation of its *Moiſture*, by a *mechanical expreſſion*, or *ſqueezing*.

9. Hence alſo it is that we are ſubject to take *Cold*, even in a warm *Room*, if we watch long; becauſe the *Pores* being cloſed by that *vigitative Contraction*, hinder *Perſpiration* too long, and too much: Therefore it is that all *Colds* are worſe towards the *Evening*, becauſe that *Contraction* cloſes the *Pores* all *day*; and not only *Colds*, but many other *Diſtempers*, eſpecially ſuch as *Perſpiration* is good for; as indeed it is for moſt *Diſeaſes*, as being the moſt *natural* and *conſiderable Evacuation*: *Moſt natural*, becauſe it requires no voluntary Motion, or Irritation of the ſenſile Parts, as that of *Siege*, *Urine*, *&c.* which either require the *Will*, or *Irritation* by *Quantity* or *Quality*, or *both*, or *all three*; but *Perſpiration* (like *Fumes* in a Chimney) requires only that its little *Funnels* (the *Pores*) ſhould be open, becauſe our *Fumes* paſs (as the other do) by their own natural Levity: And it is *moſt conſiderable*, becauſe univerſal, and that much more is evacuated that *way*, than by all *Means* and *Ways* whatſoever.

Hence it is that all Membranes gaining a *Tenſion*, by the *vigilative Contraction* in manner aforeſaid, are more rightly diſpoſed to receive and communicate *ſmart Impreſſions* to the *Animal Spirits*, while we are awake, which was the Thing aim'd at, and will be much more illuſtrated by the *Conſideration* of the *Animal Spirits*, and the *Senſitive Soul*.

Note, That the *Membranes*, *Veſſels*, and *Roads* of the *Animal Spirits*, being much narrowed and compreſſed by this *vigilative Contraction*, *Two* other main *Requiſites* for exact *Senſation* do of courſe

courſe follow, (ſo conſentaneouſly do the Works of *God* conſpire to their *Ends*) *viz.*

Firſt, That an *Impreſſion* made upon the *Animal Spirits* in *Pipes* ſo narrowed, is better, more exactly and ſmartly convey'd to the *ſenſitive Soul*, as has been ſhewn, by the *Analogy* of the *External Medium* in *ſlender Pipes.*

It is by ſuch narrowing of the *Nerves*, *Pipes*, *Roads*, *&c.* of the *Animal Spirits*, that *cold Weather*, which contracts the Parts, makes our *Feeling* more *nice* and *ſmart* than *warm Weather*, which relaxes the *Veſſels*, and gives the *ſpringy Animal Spirits* (for ſuch they are, as ſhall, by His Aſſiſtance that made them, appear) leave to expand, by which means, and the *Veſſels* widening, the *Feeling* grows duller, for want of compreſſion of the Spirits.

By what has been ſaid, you may ſee why Perſons of a fine and *delicate Texture* (that is, of *ſmaller* and *ſlenderer Veſſels*) have a more exquiſite *Feeling*; that little *Animals*, as *Spiders*, *Flea's*, and many ſuch, have moſt *nice* and *accurate Feeling*, becauſe their *Nerves*, *Veſſels*, *Pipes*, *&c.* are proportionably ſmall, and the ſmaller they are, the more accute is their *Feeling*, for the *Reaſons* aforeſaid; which was abſolutely neceſſary, becauſe they deal with ſmall Things proportionably, as their *Food*, *Treading*, *&c.* and that ſmall Things may harm them, unleſs they take diſtinct notice thereof to defend themſelves; whereas *Elephants*, *Camels*, *Horſes*, *&c.* can, becauſe of their large *Veſſels*, ſcarce feel ſuch Impreſſions, as would cruſh thoſe little *Animals* to pieces. *Lord, how manifold are Thy Works! In Wiſdom Thou haſt made them all!*

It is from this *Fineneß* and *delicate Smallneß* of the *Nerves*, *Fibres*, and *Membranes*, *&c.* that one Part has a more exquisite *Sensation* than another, and that the extream *Parts* have (generally speaking) better *Feeling*.

Secondly, It follows, that by reason of the *vigilative Contraction* of the sensile Parts, the *Animal Spirits* must gain a considerable *compressure*, whereby (as the *External Medium* is rendred fitter to convey *Impressions* by the help of *Compression*) they are better disposed to convey *Impressions* to the *sensitive Soul*; for the *Internal* and *External Medium* having like Office in the *Oeconomy* of *Sensation*, and (as you'll find) like *Qualifications*, must be affected alike by *Compression*; but whether they are the same thing, or no, I shall not need the *Discussion* of that Point here; therefore I leave it to my Tract of *Animal Mechanism*.

IV. *The Office, or Busin ß of the Animal Spirits* (or Internal Medium) *being to receive Impressions from the Organs, and convey them to the sensitive Soul*, as that of the *External Medium* (or *Air*) was to receive them from the *Object*, and convey them to the *Organ*; the *requisite Dispositions* for its purpose, are manifest from the *Analogy* of the *External Medium*, *viz.*

First, *That they should be springy*, (or *elastick*;) and that they are so, appears,

1. From their very Office, which being *tenuious* and *fluid*, they could never perform (as the *Air* cannot) without being springy.

2. If they were not *elastick*, and thereby compressible, their *Vessels* could never be so contracted (as has been shewn) without squeezing them quite out

out of them, which is a Diſorder not to be ſuppoſed in the *Works* of *God.*

3. If they were not *elaſtick* (or ſpringy) they would not fill their Veſſels upon *Relaxation* thereof, which would leave a *Vacuity*, and thereby cauſe a *diſcontinuance of Motion*, or (at leaſt) a great *diſorder* of it, which would cauſe diſmal *Convulſions*, if not *Death* it ſelf; which is moſt likely.

4. They could not be ſo active, nor indeed at all active, without *ſpringineſs*; for they cannot act up and down, and all manner of ways, (as they do) by either *Levity* or *Gravity*, or by any other known or imaginable *Qualification*, but *Elaſticity* (or *Springineſs*.)

5. It cannot be conceived why they ſhould be more active one time than another without *Elaſticity*; but they are more active at one time than another, as appears by ſeveral *Places* or *Paſſages* of the Premiſes, and in the *waking* more than in ſuch as are *aſleep.*

6. It is manifeſt, that they are *elaſtick*, by their ſpringing into a Limb held up or down; and, that with ſuch Force as to cauſe a great *Pain*, after they have been excluded from it by ſome Accident, as leaning, or preſſing too hard upon a Nerve, *&c.* for neither *Levity* nor *Gravity* can do ſo, eſpecially both up and down (as was ſaid;) nor is there any Propulſory Engine for them, as is for the *Bloud*, therefore it muſt be from their *ſpringineſs.*

7. They could not cauſe brisk and ſmart *tremulous motions* in the *Body*, if they were not *elaſtick*, for ſuch cannot be conceived by any means without it; but there are ſeveral brisk and ſmart *tremulous motions*, cauſed by the *Animal Spirits*, as in the *Shiverings* of *Ague Fits*, *Frights*, *Cold*, *Surprizes*, *ſudden* or exquiſite *Pain*, *Tremors* of the *Hands*, *Head*, *&c.* in *Old Age*, in ſome *Convulſi-*

ons, &c. Therefore the *Animal Spirits* that cauſe them are *elaſtick.*

8. Muſcles have no ſpringineſs of themſelves, when the *Animal Spirits* are excluded from them, as in *Palſies, &c.* but all *Muſcles* in their *Exertion* are very ſpringy, inſomuch that if you hold any of them back, or reſtrain them from their motion, and again ſuddenly leave them at liberty during the *Exertion*, they, or any Part moved by them, will ſpring out very violently, as in *Flipping*, an *Arm held back*, &c.

But nothing proves this Matter better than the *Tongue*, in forming the *Sound* of the Letter *R*, for in that Caſe the *Tongue*, after it is put in *Tenſion* and *Exertion*, being ſuddenly hit againſt the Inſide, or Gums of the Upper Teeth, does thereupon (as Springy Bodies uſed to do) fall into a *tremulous motion*, or *jarring*, that cauſes the *ſnarling ſound* of *R*, which nothing but ſpringy Matter can do.

9. Were they not *ſpringy*, they could never convey the *tremulous motion* of *ſound* to the *ſenſitive Soul*, and indeed over all the *Syſteme* of the *Nerves*, by which is cauſed (as may be proved) that Motion of Conſent call'd *Dancing*, and the *Fingers, &c.* to move and keep *Time* with the *Muſick*, even when it, or the *Finger*, are not as much as thought of, becauſe the *Animal Spirits* have the ſame Capacity with the *Air*, to receive and convey it, by Reaſon of their *ſpringineſs*, and greater by Reaſon of their more forcible *Compreſſion* by the *Vigilative Contraction*, ſuper added to the *Compreſſion* of the *Air*, under which they are, as well as the *Air* it ſelf, as plain Reaſon tells us; for that which Compreſſes the whole Body, muſt needs Compreſs the *Animal Spirits*: The

Expe-

Experiments of the *Air-Pump* do confirm the ſame.

10. There can be no doubt but the *Animal Spirits* are nouriſh'd, or ſuſtain'd by the *Air*, if they be not *Air*; therefore they are *elaſtick*. What needs any more *Arguments*, when ſeveral of the former are Demonſtrative? And, that,

11. All *Phyſicians* and *Philoſophers* (that I know of) do allow, that the Animal Spirits are *elaſtick*.

Secondly, *It is requiſite*, (as was ſaid of the *External Medium*) *that they ſhould be compreſſed*, to render them fit to convey *Impreſſions*; and that they are compreſſed is evident (as was before intimated.)

1. By the *Atmoſphere*. 2. By the *Vigilative Contraction*; which makes them much more diſpoſed to *convey Impreſſions* than the *External Medium*; beſides, that very often Two other *Contradictions* (that are ſhewn in the remaining *Part* of this *Chapter*) are added thereto; and, that the *Animal Spirits* are wholly contained in *Pipes*, (to prevent their Expanſion) and that of the narroweſt ſizes that can well be imagined; but the *Air*, or *External Medium*, is at large in the *Atmoſphere*; ſo that all the *Impreſſions* made upon the *Animal Spirits* are very tightly, cloſely, and ſmartly convey'd, nor have they but a little Way to paſs, that is, the *length* of the *Animal* at moſt, which alſo may be ſome Advantage to ſmall *Creatures*. But in *Sleep* the *Vigilative Contraction* being loſt, and the *Animal Spirits* thereupon expanded, all Impulſes muſt needs be carried very faintly, both becauſe the *Organs* (or Membranes) are indiſpoſed by *Relaxation*, and the *Animal Spirits* by *Expanſion* upon that *Relaxation*, for want of due *Compreſſion* to fit them.

Thus have you (after many vain Enquiries) the true Mechanical Cauſe of the Difference of Senſation, Sleeping, and Waking, and the plain Reaſon, why our Motions are ſo feeble in Sleep, viz. *Becauſe the Animal Spirits have loſt much of their Force, Springineſs,* &c. *for want of due Compreſſion, by Reaſon of the Relaxation of all the Veſſels that include the Spirits.*

Thirdly, *It is* (in ſome Meaſure) *requiſite, that the Animal Spirits ſhould have an Homogeneous Continuity,* as was ſhewn by the *Analogy* of the *External Medium,* which does not convey *Impreſſions* as well in the *Heat* of the *Day,* as in the *Night,* or after *Sunſet*; becauſe its Parts are more diſcontinued and diſgregated by the Particles of *Heat, Fumes, &c.* in the *Day Time*; nay, if Things be diſcontinued, they never carry *Impreſſions* ſo well, tho' placed contiguouſly afterward; Thus a long *Tree* that conveys ſounds ſo exactly from one end to the other, while all is continued, and in one Piece, will not convey the *ſound* ſo well if it be cut into many *Pieces,* tho' they are afterward put cloſe one to the other.

As to this Matter of *Continuity* in the *Animal Spirits,* ſeeing it does not much concern us, and that *People* in a State of *Health* are ſuppoſed to have it, and that it is not our *Buſineſs* here to enter upon the Conſideration of Nervous Diſtempers, I need not uſe any more Words about it; but that if it any Way happens to be diſcontinued, as either by the *Penury* thereof, that they do not quite fill all Parts of their *Veſſels,* or any Matter intercepting their Parts, or that the *Veſſels* ſhould be ſo relaxed, or widen'd, that the *Animal Spirits* cannot ſo well fill them up, *&c.* ſuch Cauſes muſt deſtroy

deſtroy or leſſen Senſation, tho' the bare mixing of *Fumes* with them would not (conſidering the ſhortneſs of the *Way* that Impreſſions are carried in *Animals*) much alter the Caſe, as you find *Fumes* in the *Air* do not much hinder *ſound* at the diſtance of a *Yard* or *Two*, wherein it is inſenſible (to common Obſervers at leaſt;) ſo that if ſome *Fumes* from a Grain or Two of *Opium*, did mingle with the *Animal Spirits*, it would not cauſe a ſenſible *difference* of *Feeling* in the ſhort ſpace of the length of an *Animal*: But I have proved, That no ſuch *Fume* from the *Opium* mixes with them, therefore need ſay no more of this *Matter*.

V. *The Office or Buſineſs of the ſenſitive Soul in the Oeconomy of Senſation, being to perceive the Impreſſions conveyed to him by the Animal Spirits*, that he may, if he finds them diſagreeable, beſtir himſelf in Defence of the *Animal*.

Firſt, *It is requiſite he ſhould attend to all Impreſſions offer'd him by the Animal Spirits*, otherwiſe *Impreſſions* of great Concernment may eſcape his notice, and conſequently want his *Aſſiſtance* by Way of Defence. For

It is manifeſt, That when his *Attention* is diverted by any *Object*, more eſpecially by ſuch as mightily pleaſes him, as in the *Act* of *Venery*, and other *Pleaſures*, eſpecially if *intenſe*, that he does not perceive other *Objects* at the *Time* that he is ſo diverted; and if the *pleaſant Diverſion* be *intenſe*, and *permanent*, as in the Caſe of *Opium* and *Wine* drank in a conſiderable Quantity, he is ſo taken up, diverted, or charm'd therewith, that he does not attend to the Buſineſs of *Senſation*. This is one *Reaſon* why ſuch as are far gone in

Drink, have none of their *Senſes* aright; but as to the *Illuſtration* of this *Matter* you may expect more hereafter.

Note, That the *ſenſitive Soul* is the only Thing in an *Animal* that has *Perception*, and therefore the only Thing that is ſenſible of any *Grievance*, *Wearineſs*, *Hunger*, *Pleaſure*, *Comfort*, &c.

Secondly, *It is requiſite, that it ſhould uſe all Means that is in its Power, that the Impreſſions ſhould be brought to it very entirely, exactly, ſmartly*, &c. ſo as to have due notice of all *Objects*, and the ſmalleſt *Impreſſions* that may be.

For which good *Ends* and *Purpoſes God* has endued the *ſenſitive Soul* (as will be fully proved) with a Power of contracting all the ſenſile, ſmall, and ſlender *Pipes*, *Veſſels*, or *Paſſages* of the *Animal Spirits*, for the more expreſs, diſtinct, and accurate Conveyance of all *Impreſſions* by the Help of *Compreſſion*; Therefore the *ſenſitive Soul* taking the *Advantage* thereof, for better Information, in order to *Self-Preſervation*, does (by the Appointment of the Preſerver of all Things) execute his *Power* by the aforementioned *Vigilative Contraction* of thoſe *Parts*, to cauſe their *Tenſion* and *greater Compreſſion* of the *Animal Spirits*, to improve the *Impreſſions* that are to be convey'd to him, and render them more obſervable; This *God*, who has made nothing to be idle, and particularly ordered the *ſenſitive Soul* in *Adam* for Labour, eſpeceally in *Reference* to their own Safety and Preſervation, has made to be the ordinary *Employ* or *Day-Work* of the *ſenſitive Soul*, that by the ſaid *Vigilative Contraction*, the *Organs*, *Membranes*, *Veſſels*, &c. may be render'd more *tenſe* and *firm*, and the *Animal Spirits* more *compreſſed*, *ſpringy*,

springy, prompt, flippant, and *forcible,* for the Benefit of *Sense* and *Motion,* upon all Occasions of *Defence, Flights, Struggles, &c.* which is our State of *Vigilancy* (as has been intimated.)

But the keeping of the said Parts, Membranes, &c. in *continual Contraction,* even against the *Renitency* of the *elastick Spirits,* (which resist, and thrust the harder against their *Vessels,* by how much the more they Compress them by the *Vigilative Contraction*) being a continual tedious *Labour* and *Fatigue,* of which the *sensitive Soul* being *sensible,* (as the only Perceiver of *Lassitude,* or indeed of any Thing besides, in an *Animal*) and in his *Nature* but *material, changeable, fatigable, frail, subject* to be worn out, and *capable* of *Decay,* (which makes the Certainty of *Death* in *all Animals,* and in us since the *Fall* into an *Animal Nature*) does, upon that Account, and lest the continual *Contraction* and tensive Stress of Parts, by that Means, should spoil their *Tone,* and to recruit the wasted *Sprits* by Rest, (after tugging all Day at the *Vigilative Contraction*) grow willing to give over the *Drudgery,* however convenient for the *Uses* aforesaid; Therefore being allow'd convenient *Rest* by his Maker, he, for the great Benefit of *Refection,* without which he cannot continue his Being, and for the sweetness of *Ease,* loosens the Reins of *Vigilative Contraction*; whereupon *Sensation* and *Promptitude* to *Motion* (which were maintain'd by that *Contraction,* causing the *Tension* of *Organs,* and *Compression* of the *Animal Spirits,* as has been *Mechanically* demonstrated) fail by the *Relaxation* of those *Organs, Membranes,* and *Vessels* of the *Spirits,* and the consequent *Expansion* of the *Animal Spirits*; so that now only the Compression of the *Atmosphere* remains, which (as you see in a *Gut* half full of Air under that Pressure) is not sufficient to *convey the*

Im-

Impressions with any *Smartness*, or cause the *Animal Spirits* to spring vigorously into *Motion*; which Decay or Failure of *Sense* and *Motion* by *Relaxation*, and the consequent Expansion of the *Animal Spirits*, is the State of *Natural Sleep*.

Note, That *Relaxation* is a necessary Consequence of the *Privation* of *Contraction*, and requires no *Labour*, but a bare Remission of that *Contraction*.

Note, That the Watching Part of our Lives is upheld by *Force*, and that *Nullum violentum est diuturnum*, and consequently a necessity of *Sleep*, and at last of *Death* it self.

Thus have you the true *Reason* of *Sleeping* and *Watching*, which will naturally, plainly, and easily solve all the *Phenomena's* thereof; for it is most evident from the Premises:

1. Why *Watching* and *Sleeping* observe a Proportion between them; the being tired with one being the cause of the other.
2. Why *Sense* and *Motion* do fail so much in *Sleep*, *viz.* by the *Relaxation* of all Parts, and *Expansion* of the *Animal Spirits*.
3. Why they always fail together, and in like *Proportion*.
4. Why they do not wholly fail in *Sleep*; because the Compressure of the *Atmosphere*, *&c.* remains.
5. Why in *Sleep* the *Limbs* are (like a *Gut* half full of *Air*) *lax*, *limber*, *flaccid*, and yielding all manner of *Ways*; because all the innumerable small *Vessels* that contain the *Elastick Animal Spirits*, are (as that half fill'd *Gut* I mentioned) not tightly fill'd, which if they were, would be *firm* and

tense,

tenſe, as ſuch a *Gut*, blown up very full and forcibly, is; which *Veſſels* being all over the *Body*, confirm the whole Tone when we are awake, and the *Vigilative Contraction* compreſſes the *Animal Spirits* into a Steadineſs, and (as it were) a kind of *Solidity*.

6. Why (as appears by *Statick Demonſtrations*, and *Experiments*) we perſpire more when aſleep than awake; becauſe the *Pores* are cloſed by the *Vigilative Contraction*, and open'd in *Sleep* by the *contrary Relaxation*, which therefore always cauſes free *Perſpiration* where-ever it happens, as in *fainting Fits*, *Syncopes*, *Leipothymies*, and by *Warmth*, eſpecially if moiſt and emollient, as in *Baths*, *Fomentations*, *Feet Waſhes*, *Head Waſhes*, *&c.* as alſo when *Pleaſure relaxes*, as in the *Act of Venery*, great Joy, after good *Meals*, or ſome *Glaſſes* of *Wine*, *&c.* all which cauſe plentiful *Perſpiration*, becauſe they relax, and thereby open the *Pores*, (as more fully appears in the *following Diſcourſe*) by Reaſon of the Pleaſure that they cauſe, which diverts the ſenſitive Soul from his Employ of *Contraction*.

7. *Why*, the *Pores* being open by the *Relaxation*, we *ſweat* in our Sleep, if we are fill'd with Matter for it, *viz.* Ἱδρὼς πολὺς ἐξ ὕπνου ἄνευ φανερᾶς ἀσιτίης γίνόμενος, τὸ σῶμα σημαίνει ὅτι πλείου τροφῆς, That is, *Much Sweat in Sleep argues, that much Food* (or Nutriment) *was taken*; of which *Drink* is the greateſt Part in Bulk, even in Sober Perſons. I mention this to ſhew the Difference in the Caſe of *Perſpiration* and *Sweating*, for that always happens in *Sleep*, but not *Sweat*, unleſs the *Body* be well fill'd with Moiſture; To ſhew the Cauſe of which *Difference*, will be the Buſineſs of my Tract of *Animal Mechaniſm*, if I have not hereafter an *Occaſion* to do it in this *Tract*, as (I ſuppoſe) I may.

8. *Why*

8. *Why* Sleep cures Colds (by opening the Pores.)

9. *Why* the Skin is more florid in Sleep; becauſe (as has been ſaid) it being relax'd admits the *Blood* into it, which *Vigilative Contraction* does in good meaſure repel, and thereby cauſe the Skin to appear more *white* and *pale*, as it is, and any one may obſerve upon awaking.

10. *Why* the *Eyes* look deadiſh in Sleep, *viz.* becauſe (as has been ſhewn) the Humors do not fill up the relaxed *Cornea* to a due *Tenſion* and *Rotundity*, which (as was ſaid) makes the *Cornea ſhine*, ſparkle, and particularly to reflect a brisk *Speck* of Light, (as ſhining round Things muſt do) which *Speck* if Painters omit, the *Eye* looks deadiſh, therefore they ſhould, when they have a mind to expreſs the *Deadneſs* of the *Eyes*, as in *Fainting Fits*, *Syncopes*, *Sleep*, *Death*, *Wanton looſe Oglings* of *Lovers*, *Drunkenneſs*, *&c.* omit that Speck, or rather draw it duller, wider, and diſcompoſed in Figure, with the *Pupil* very large, and the Upper *Eyelid* falling down looſely, which would exactly expreſs the *Deadneſs* of the Eye in all thoſe Caſes of *Relaxation*, in which alone it ſo appears. *Note*, That the *Reaſon* why ſome in ſuch Caſes ſee *divers Colours* before their *Eyes*, is, becauſe the uneven *Cornea* variouſly retracts and reflects the Light, which I mention becauſe none (that I know of) have obſerved the Cauſe.

11. *Why* People are more ſleepy in warm moiſt *Weather*, *viz.* becauſe the Parts are more relaxed, and the Preſſure of the *Atmoſphere* leſs to aſſiſt the *Vigilative Contraction*, to keep us in a waking State by the *Compreſſure* of the *Animal Spirits*: How much better therefore is a *cool* and *dry Air*, that raiſes the *Mercury* high in the *Barometer*, (or *Weather Glaſs*) both for *Health* and *Action*? becauſe it renders the *Animal Spirits* more powerful,

ful, prompt, and *ſlippant* by the *Compreſſion.* This ſhould be obſerv'd by ſuch as are to run *Races* alone, lift *Weights*, or perform any Thing that requires *Strength*, *Vigour*, or *Speed*; nor can I doubt, but if we had an Artificial Means to compreſs Men's *Bodies* in a high manner, (as by putting them into convenient Cavities, and forcing Air upon them) but they would be much ſtronger for the Time, and thereby enabled to do *Exploits* beyond their ordinary Strength; which puts me in mind of ſeveral Things that confirm it very much, as Mens lifting of greater Weights in low Places, than on the top of very high *Hills*, where the Preſſure of the *Air* is leſs to compreſs the *Animal Spirits*; *The Contraction* of all Parts in lifting of great Weights; *The* prodigious *Leaps*, and *Swiftneſs* of ſome Perſons in great *Frights*, *Terrors*, *&c.* which mightily contract the *ſenſile Parts*, and *Veſſels* of the *Animal Spirits*, by which Means they are render'd more *ſpringy* and *powerful*.

Note, That the true Cauſe of Strength is the Compreſſion of the *Animal Spirits*, and that (probably) the Force of Muſcles may ſome way or other depend upon't, which is not my Buſineſs to explain at preſent.

Note, That it is the *Membranes* are primarily contracted, and the Medullary Part of the *Nerves*, *Spirits*, *&c.* compreſſed thereby by Conſequence.

12. *Why* the *ſoft fleſhed*, and *moiſt*, are more *ſleepy*, as *Children*, *&c. viz.* becauſe the *Compreſſion* of their *Animal Spirits* is not ſo great by Reaſon of the *laxity* of their Parts, ſo are they weaker for the ſame Reaſon, which tells you why *little* Men,

Men, whoſe Fleſh is firmer, that are no bigger than *Boys*, are much ſtronger than *Boys* or *Women* of the ſame bigneſs.

13. *Why* warm and emollient *Baths*, *Fomentations*, *Feet* or *Head Waſhes*, *&c.* do (as *moiſt* and *warm Weather*) cauſe *Sleepineſs*; and indeed all Things that cauſe *Relaxation*, or incline the *ſenſitive Soul* to leave off contracting, as *Wearineſs*, *&c.* do cauſe *Sleep*.

Note, That in dry Bodies, as old People, *&c.* ſuch *Emollient Baths*, *Fomentations*, *&c.* with the Uſe of *Emollient Moiſtners* inwardly, will cauſe *Sleep* very finely, when *Opium* it ſelf will not; and that *Opium* in ſuch Caſes ſhould be uſed with ſuch Things both *internally* and *externally*; but (which is not obſerv'd) the *Baths*, *Fomentations*, *&c.* ſhould not be above the Warmth of *Bloud*, becauſe the *Heat* may otherwiſe cauſe too much motion of the *Bloud* and *Spirits*, which is a great Enemy to *Sleep*, that *conſiſts in their Reſt*, *and the aforeſaid Relaxation of Parts*, by both which co-operating, you may, and cannot fail to cauſe any Man to *Sleep*, if you can make them concur.

14. The ſame *Relaxation* cauſes the *Pulſe* to be larger and ſlower in Sleep, *Nocturnal Pollutions*, want of due Contraction and *Senſation* at Stomach, by which Means the Meat ſtays longer there in our *Sleep*, than when we are awake; So,

15. *Frets*, *Commotions*, and *Perturbations* of the *Spirits*, *&c.* are compoſed by *Sleep*, becauſe the *ſenſitive Soul* (who is the *Original* of all *motion*) is at Reſt, and that the *Animal Spirits* being expanded, are nearer their abſolute *Reſt*, which conſiſts in a full and perfect *Expanſion*, ſo that there is no farther *Endeavour* towards *Motion*.

16. Sen-

16. Senſation being much leſſened by the *Expanſion* of the *Animal Spirits* upon the ſaid *Relaxation*, the Senſe of the *Irritation of Humours* is thereby leſſened, or quite taken away, whereupon all *Fluxes* occaſioned by the *Irritation of Humours*, as *Diarrhea's*, *Diſenteries*, *Catarrhs*, *&c.* are ſtopt or moderated (at leaſt) by *Sleep*; Beſides, that *Relaxation* being quite contrary to *Contraction*, by which thoſe *Humours* are ſqueeſed out, lets the Humours ſtay quietly where they are, *Relaxation* being more for receiving, containing, detaining, and ſuſpending Humours in the Parts, than ſending them forward, as you ſee in a Spunge firſt contracted, and afterward ſuffered to dilate, or expand it ſelf in a *Diſh* that has ſome Water in it, which it takes into it ſelf, and ſuſpends till ſomething ſqueeſes it out by contracting it.

17. Therefore it is that the Spittle does not come into the Mouth in Sleep, or very little, and that People are apt to awake thirſty, tho' it is ſoon taken off in ſome meaſure by the *Vigilative Contraction* ſqueezing out the *Spittle* into the Mouth, unleſs there is ſome ſpecial Cauſe to the contrary.

18. For the ſame Reaſon the *Menſtruum* of the *Stomach* comes but very ſlowly into the Stomach in Sleep, which is one *Cauſe* that *Digeſtion* goes on but ſlowly in *Sleep*.

Note, That *Digeſtion*, and ſending the Chyle out of the Stomach, depending both upon *Contraction*, they are haſtned and retarded in *exact Proportion*, ſo that the *Extruſion* keeps equal *Pace* with the *Digeſtion*. How equal and duely proportioned are the Works of Nature!

19. It is plain alſo from what has been Stated concerning *Sleep*, why *Ague Fits* ſeldom (if ever)

ever) take *People* in the time of their firſt ſound *Sleep*, becauſe the *Shivering* is cauſed by a *grievous Senſation* of the *ſenſile Parts*, which cannot well happen in that *ſound Sleep*, wherein there is ſo little Feeling by Reaſon of the ſaid *Relaxation*; and becauſe *Relaxation* oppoſes *Contraction*, by which that *Shivering* is promoted. Such a *Relaxation*, and Failure of *Feeling* thereupon, is the true Cauſe why *Opium* puts off *Ague Fits*, &c. So,

20. The *Relaxation* in *Sleep* ſtops *Vomiting*, by taking away the *ſenſe* of the irritating Cauſe, and quieting (as I have intimated) all Motions in general; ſo *Sleep* ſtops *Hiccoughs*, *Hemorrhages*, *Diary Fevers*, &c.

21. Why *Watching*, *Labour*, or what impairs the Spirits, and tires the *ſenſitive Soul*, inclines us to Sleep, that is, diſpoſes the *ſenſitive Soul* (the only Feeler of Laſſitude) to give over Contracting the Senſile Parts, which (as will plainly appear by and by) ſpends the Spirits, as Sleep by relaxing them cauſes a *Recruit* thereof.

To be ſhort, (tho' one can hardly be too long in ſolving *Phenomena's*, which is the *Proof* of the *Truth* of a Man's *Aſſertion*) the *Mechanical Demonſtration* that I have made of the State of *Sleeping* and *Waking*, does ſo evidently explicate all the *Phenomena's* of both, that I am even aſham'd to run any farther upon ſuch plain Matters, (ſo obvious are Things when the *Truth* is known,) and therefore (having mention'd thoſe *Circumſtances* and *Effects* of *Sleep*, that mainly concern us) I muſt give over, leſt the *World* ſhould think, that I take all my *Readers* to be *Idiots*, by uſing too many Words in ſo obvious a Thing; or, that I am no better for uſing them without Cauſe; for the *Truth* of this Matter ſeems to me to outſhine

ſhine all the *Arguments* I can make for it, ſuch Splendour does *Truth* ſhew upon the firſt *Glimps* thereof, as I take the Account I gave of *Sleep* and *Watching* to be; for the Opinions I have met concerning them were quite *contrary* to, or very *remote* from what I have ſtated.

1. They went quite *contrary* to it that ſaid, That the *Animal* Spirits were expanded, and the *Pores* of the *Brain*, *&c.* more open (and conſequently more lax) in *Watching*, as *Willis*, *and ſeveral others*; who therefore ſay that *Coffee*, *Volatile Salts*, *&c.* are *Antihypnoticks*, (or good againſt too much *Sleepineſs*) becauſe they cauſe an *Expanſion* of the *Spirits*, and open the *Pores* of the *Brain*, ſuppoſing (forſooth) that they marched up and down, and ſo kept the greater ſtir upon the falſe Imagination of their *Roads* being more open, which (as was proved) are really more cloſe. *Coffee* keeps us from *Sleep* by drying, binding, and both Ways conſtringing the *Veſſels*, as alſo by a wide graring Quality, which therefore does irritate them to contract, beſides that the Saline Particles cauſing an *Agitation*, may contribute thereto, ſo that by *conſtringing* and *agitating*, it directly oppoſes Sleep, which proceeds from Relaxation and Quietneſs.

2. They were very *remote* from the Mark, that ſaid (as *Wedelius* aſſerts all do) that *Vapours* were the cauſe of *Natural Sleep*, which bear no manner of *Proportion* thereto (as was ſhewn;) As they were alſo who madly talk'd, That the *Animal Spirits*, which have neither *Life*, *Senſe*, *Motion*, or *Election*, did of themſelves retire very knowingly to the *Brain* in *Sleep*, and left the *Limbs*, *&c.* deſtitute of them, whereas (as has been *Mechanically* proved) they have more *Room* than that at other times in the Limbs, and all the *ſenſile Parts*.

But I will not argue againſt ſuch ſenſeleſs and precarious *Abſurdities*; it is not worth the while, eſpecially ſince the *Truth* is manifeſtly diſcovered: It would not have been ſo ſilly to have affirm'd the quite contrary, *viz.* That the *Animal Spirits* are forced into the ſoft and yielding Brain, in Watching, by the *Vigilative Contraction* of all the *ſenſile Parts* repelling them, as when Cold repels them by a ſtrong *Contraction* of the Parts, and cauſes a *Stupor* or *Sleep* thereof (as they call it.) But what have we to do with ſuch inſufferable *Trash?* Therefore bidding it adieu, let us purſue our *Buſineſs*.

That it is the *Senſitive Soul*, and nothing but it, has that *Contracting Power*, is evident;

1. Becauſe it is the Original of all *Motion* in the *Animal* as ſuch; and that nothing beſides it has any *Life*, *Perception*, *Motion*, or *Power*, and therefore muſt reſt till they are moved.

2. Becauſe, That when the *Senſitive Soul* is diverted by *intenſe Pleaſure*, from attending his Buſineſs, immediately *Relaxation* follows; as in the *Pleaſure* of the *Act of Venery*, by *Wine*, *Joy*, *&c.* in which you have all the *Effects* of *Relaxation*, as *Deadneſs* of the *Eyes*, *Dilatation* of the *Pupilla*, plentiful *Perſpiration*, *Floridity* of the *Skin*, a large *Pulſe*, and ſometimes a conſiderable *Failure* of *Senſe* and *Motion*, as in the moſt pleaſant time of the *Venereal Act*, *Deliquiums*, *Drunkenneſs*, *Syncopes*, or *Ecſtaſies* upon *intenſe Pleaſure*, (which are very properly called *Ecſtaſies*) *Leipothymies*, *Leipopſychies*, *&c.* which ſignifie the *Soul's leaving us* without his Help by *Contractions*, which he then does not exerciſe, as being charm'd, and wholly taken up with *Pleaſure*. This is the true Cauſe of all *Deliquiums*, *&c.* upon *Pleaſure*, *Joy*, *&c.* all which cauſe great Relaxations, and thereby Loſs of *Senſe* and *Motion*, as being its neceſſary Conſequences.

3. Be-

3. Because *grievous Sensation*, which belongs only to the *Sensitive Soul*, puts us immediately out of *Sleep* into a *Vigilative Contraction.*

4. Because the *Sensitive Soul* can, when we are Sleepy, oppose it, by continuing the *Vigilative Contraction*; which proves *Vigilative Contraction* to be in his *Power.*

Note, That there is also other sorts of *Leipothymies*, *Deliquiums*, *&c.* upon the *Sensitive Soul*'s being over-tired, (whereof *Natural Sleep* is but a common and ordinary *Degree*, that happens of Course for our Relief) or over-born with some *Fatigue*, &c. as when somewhat grieves at *Stomach*, and that it has laid about it all manner of *Ways*, by *Vomiting*, *Convulsive Motions*, *&c.* to be rid of it, till it can work no longer; whereupon it lays down the *Cudgels*, desists from all further Endeavour by *Contractions*, yielding it self to *Ease*, seeing all Striving is to no Effect: So, that tho' this *Deliquium*, and the former, differ in their first Causes, yet do they agree in the last and immediate, *viz.* the *Sensitive Soul*'s not attending his Business of *Contraction*, whereupon follows a *mighty Relaxation*, as appears by the *Deadness* (or *Relaxation*) of the *Cornea*, *Dilatation* of the *Pupil*, a *great Laxity* of all Parts, a large *Pulse*, or none, very plentiful *Perspiration*, Stops of *Hemorrhages*, and all Fluxes that require *Contraction*, &c. which happen both upon the Account of the great *Relaxation* it self, (as has been shewn) and the almost absolute Rest of all Things by the *Sensitive Soul*'s withdrawing himself from *Business*, more than in Sleep it self. I therefore observing the Degrees of *Sleep*, &c. do *Note*, That (*God* and *Nature* using a due *Proportion* in all Things) the *Sensitive Soul* uses several *Degrees* of *Relaxation*, according as he is tired, and *Refection* is wanted: Hence it is, that

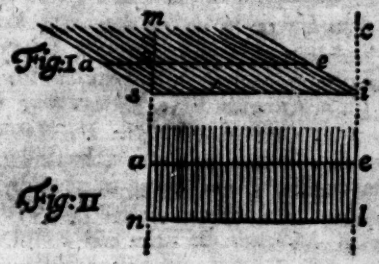
such as are much tired *sleep* more profoundly, that our *first Sleeps* are the soundest, and that Sleep gradually *declines* in degrees (as we are recruited) till we awake; the nearer which we are, the more we *dream*, the state of *Dreaming* being a kind of Twilight between sound *Sleep* and Awaking, or between a full *somniferous Relaxation* and *vigilative Contraction*. And as the *Sensitive Soul* uses all *degrees* of *Contraction* below that of the *Vigilative*, till it comes to bare *Compression* of the *Air*; so it can exercise *super-vigilative Contraction*, (if I may so call it) that is, much higher *degrees* thereof than what was requisite ordinarily for a state of *Vigilancy*, as in Cases of Danger to the *Animal*, *Frights*, *Terrours*, *grievous Passions* and *Sensations*; by which means the *animal Spirits* being more compressed than under the ordinary *vigilative Contraction*, Sensation grows more *nice* and *smart*, and Motion more *prompt* and *vigorous* (they always going together) for the *Defence* of the *Animal*, by extraordinary *Flight*, *Repulsion*, or otherwise. Hence it is, upon *Fear*, *Terrour*, *grievous Passion*, or *Sensation*, (which manifestly proves the Being of such an extraordinary *Contraction* upon such Occasions) That,

1. *Perspiration* fails in a yet higher degree than under bare or ordinary *vigilative Contraction*, as appears by infallible *statick Experiments* and *Demonstrations*.

2. It is by reason of the said *defensive Contraction*, (for so I call it, because it is excited in an extraordinary manner for the *defence* of the *Animal* in time of need, or great *Exigence*) That in *Frights*, *Terrours*, *&c.* our *Hair*, *Dogs*, &c. does stand on end, or more upright; 1. Because the *Pores* do, by that violent *Contraction*, strictly close about the *Root* of the *Hair*, that it cannot swag, incline,

or

or yield any way, by reaſon of its *Weight*, &c. as when the Skin is more *lax* and *ſoft*, and the Pores, wherein the *Hair* is fixed, more open. 2. Becauſe (which is the *main Reaſon*) the ſaid *Contraction* renders the oblique *Pores* more upright; as ſuppoſe the *Pores* and *Hair* do naturally ſtand obliquely, (as they do to carry off Wet, *&c.*) as in *Fig.* 1.



And that (*a*) in *Fig.* 1. is, by the ſaid *Contraction*, brought nearer to (*i*), as much as is from (*a*) to (*o*), then will the *Pores* and *Hair* ſtand upright, as in *Fig.* 2. and the Skin *a*, *o*, *e*, *i*, *s*, contracted and brought within the prick'd *Perpendiculars*, whereas in *Fig.* 1. it excur'd beyond the *Perpendicular n*, *m*, as much as is from *a* to *o*.

3. For the ſame Reaſon it is, That the Face, in *grievous Paſſions* and *Senſations*, as acute Pain, *&c.* is contorted and wrung awry, as you ſee in Perſons that cry becauſe of *Grievances*, (after the ſame manner as when they ſtrive to lift up a great *Weight*) and that at the ſame time Tears, and Moiſture at *Noſe* and *Mouth*, are ſqueezed out by the ſame *Contraction*; which makes People uſe the Saying of *Caſting Snot about* when Men cry. It is for the ſame *Reaſon* that *People*'s Mouths *water*

extreamly when they are trimm'd with a bad *Razor* that puts them to *Pain*, which contracts the Parts, and squeezes out the Spittle.

4. The *Pulse* grows sensibly narrower and harder by the same *Contraction*.

5. It is by the *Contraction* upon *grievous Sensation*, that our Mouths water very much upon a *Nausea* at *Stomach*, because of the continuity of the Membranes of the *Mouth* and *Stomach*.

6. The same *Contraction* is the true *Reason* why People, upon *Hunger* (which is a *grievous Sensation at Stomach*) have so much Moisture (or Spittle) in their Mouths, and so much the more when they see good *Victuals*, and cannot have it, because the *Grievance* which causes the *Contraction* that squeezes it out, is by so much the greater. This is the cause why the Mouth waters when hungry *People* see or smell good Victuals. By the same Contraction Moisture is squeezed out into the *Oesophagus*, (or *Gullet*) and the *Menstruum* into the Stomach at the same *time*; where (observe *God*'s Good and Wise *Providence*) that *Hunger* which calls for *Meat*, at the same time provides Spittle to lubricate it for swallowing, and to help *Digestion*, render the *Gullet* slippery and distensible, and causes the *Menstruum* to flow more abundantly into the *Stomach*; and all this when most needed, and that exactly in *proportion* to the *Hunger* (or *grievous Sensation*) that causes the *Contraction*.

It is well worth your *noting*, That God's *Wisdom* does always cause the *Want* of what is necessary in *sensile Creatures*, to be the soliciting and urging Cause for supply, that a due *Proportion* may be observed between the Supply and the *Want*; which may upon the telling of it appear so plain a Case, that it is scarce worth the mentioning; but (believe me) it is so little observ'd, (as plain

as

as it may seem to be) that *People* have, and do err extravagantly for *want* of noting it; which if they had noted, they could never have said that *Vapours*, or the *retiring* of Spirits into the *Brain*, *&c.* was the *Cause*, or *Call* of *natural Sleep*; nor *feigned Menstruums* to be the cause of *Hunger*; but would have duly considered what is mainly supplied by *Eating*, or recruited by *Sleeping*, &c. and then had nothing to do but to conclude the *Defect* of that to have been the Cause that solicited for the Supply in *proportion* to the *Defect*: Which, if observed, will most naturally and easily lead you to the true *Knowledge* of the Causes of all *Appetites* in an *Animal*, upon a few Minutes Consideration; for want of which most plain and (one would think) very obvious *Method*, the deviating *World* has sadly puzzled it self about the Cause of *Hunger*, *Thirst*, *Sleep*, and the like, to this *day*, and still is in Disputes about them, of which (tho' my advertent *Reader* may well prevent me, by using that *natural Method*) I shall (*God willing*) give an account in my Tract of *Animal Mechanism*: Only *note* here, That I do not mean bare privative Defect, as such, to be the positive Cause; but that the Defect of what keeps or guards the Stomach, *&c.* from the Grievance, causes other Matter to grieve it, cause Hunger, *&c.* without which means, no Proportion can be observed between Hunger and what takes it away, or our *Food*.

7. The same *defensive Contraction* does, upon *grievous Sensation*, as *Pain*, *Cold*, *Terrour*, *&c.* cause a *Corrugation* of the *Scrotum*, contract the Skin into little *Tubercles* like that of a *Goose-Skin*, *&c.*

8. By it, upon *grievous Sensation*, as by squeezing the *Nose* very hard, pulling the *Hair*, *Sand*, or any such thing, in the *Eye*, or a *Grievance* by the *Volatile Particles* of *Onions*, *Mustard*, *Horse-Radish-*

Roots, &c. the Parts and *Membranes* about the *Eyes* contracting, ſqueeze out *Tears*, that what grieves the *Eyes* may thereby be waſhed away, or qualified, as much as the *Tears* can do it.

9. By this *Contraction* repelling the *Bloud*, the *Skin* grows *Pale* by *Cold*, *Fear*, *Pain*, *&c.* which alſo cloſing the *Pores*, ſtop *Sweat*, as in a moment. You'll have an account hereafter how *Contraction* may cauſe Sweat by *ſqueezing* in ſome Caſes, and ſtop it by *ſhutting the Pores* in other Caſes.

10. It is by it that *Contraction*, that *Fear*, *Cold*, *&c.* cloſing the *Pores*, and repelling the Bloud, ſtanch Bleeding: So happens alſo a greater *Contraction* of the *Pupil* of the *Eye* by the ſame Cauſe.

11. It is the *Violence* of this *Contraction* upon *Fear*, *Terrour*, *Pain*, *Cold*, *&c.* cloſing the ſmall *Veſſels* of the *Animal Spirits*, and thereby repelling them, cauſes the *Shivering* in thoſe *Caſes*, by the *Renitency* of the *elaſtick Animal Spirits* ſpringing back again, *toties quoties*, having gain'd more *elaſtick Force* by the very *Compreſſion* it ſelf, which that *Contraction* cauſes; ſo that by reaſon of the dubious *velitation* (or *skirmiſhing*) between the repelling *Contraction* and the *ſpringing Spirits*, happens a *tremulous Motion*, (as of *quavering Springs*;) which *Shivering in Ague-Fits* did formerly lead me to the *Situation* of the *Cauſe* of *Agues* (when I writ my Book *De Febribus intermittentibus*) in the *Anguſtiæ* at the end of the *Veſſels*, which terminate in the *Membranes*; the *grievous Senſation* of which, cauſes all the Shivering that happens in any Caſe to *Animals*.

12. By the ſame *Contraction*, when very violent, and of the whole Body, *cold Sweats* happen in *Pain*, *Fear*, *Terrour*, &c. while it violently ſqueezes out the outmoſt, and therefore coldeſt Moiſture

of

of our *Bodies*, as *Laundresses* do Water out of wet Linnen by *Contortion*. Thus if you dip one *half* of a wet cold Sheet in hot Water, wrapping the hot side within the cold, or let a *warm Sheet* that is contorted cool on the out-side of it, and then wring it as *Women* do Linnen, the Water that first exudates will be cold; for in this *Case* the closing of the *Pores* avails nothing to hinder it, as long as the expressing *Force* masters it; more *especially* in *Animal Bodies*, wherein the Parts are so contrived, that *Humours* design'd for *Excretion* cannot well return, and therefore must, upon *Contraction*, run out.

Hence it is that *Alum*, or *Vitriol*, which are very astringent, and therefore close the *Pores*, will notwithstanding cause the *Mouth*, or *Nose*, to run very plentifully with Moisture, by *contracting* all the *Membranes* about the *Mouth*, or *Nose*, and thereby squeezing out the *Moisture* design'd to be excern'd, which cannot return, because the *Parts* are contriv'd against the return or *readmittance* thereof; whereas *Alum*, or *Vitriol*, will stanch or stop *Blood* by the same *Contraction*, because it may return (as not being design'd to be excern'd) either into the *Arteries*, and so pass by other *Branches* thereof, or (which is more ready and natural) keep its course into the *Veins*. So the two *Riddles* (that I have known some *Proud Physicians* amaz'd at, tho' but *Trifles*) of *Alum* and *Vitriol* causing the Spittle, *&c.* to come out, instead of stopping it by their *Astringency*, and their stopping *Blood* at Nose at the same time they cause the *Snot*, or other *Humours*, to run out, are unfolded.

13. It is by this mighty *Contraction* growing to an enormous *degree*, that the *Animal Spirits* being violently compressed, grow exceeding irrequiete, as upon *Convulsions* in great *Pain*, or very grievous Sense,

Senſation at *Stomach*, *&c.* while the *ſenſitive Soul* compreſſing them with mighty *Force*, and ſomewhat diſorderly and unevenly, becauſe of the *Confuſion* and *Hurry* he is in to relieve the *Animal*, they by their ſpringineſs fling up and down with great *Vigour*. This makes *convulſive Motions* have great Strength.

14. The Body under this Contraction is manifeſtly ſhrunk by meaſure, eſpecially when the Senſation is very grievous, but moſt of all if they cauſe a *general Convulſion*; which I manifeſtly obſerved in a little Bitch, that was convulſive all over for three Hours, and was juſt expiring, when I gave her the *Sal Volat. Oleoſ.* of *Opium*, which perfectly reſtored her by relaxing the Veſſels.

Some may think it ſtrange, That *Nature* ſhould contrive a more nice and ſmart Senſation (which the *Contraction* of the *Veſſels* of the Animal Spirits muſt cauſe by *compreſſing* them, *&c.*) in *Pain*, and by it; which becomes ſo much the more acute; whereas one would judge, That *Nature* would rather contrive its *Eaſe* than improve its *Smart*.

You are to know, That the *Pain* is in order to *relieve* the *Animal*, by exciting all its *Powers* to defend, expel, or reject the *Cauſe*; and that, without a *grievous Senſation*, the *ſenſitive Soul* is neither minded nor excited to do it; and the more the *Pain* is, the more it is ſtirr'd up to *Self-preſervation*, and (as was ſhewn) the more vigorous do its *Motions* grow by the *Compreſſion* of the *elaſtick Spirits* to perform that Work; ſo *Nature*, not regarding the *Pain* (which is rather for good) as much as taking away the Cauſe, advances that, for this *Purpoſe*; like a wiſe *Phyſician*, who finding a *Grievance* at *Stomach*, not ſufficient to excite effectual *Vomiting*, to throw away the grieving Cauſe, adds to the *Grievance* by giving a *Vomit*; which becauſe (as was ſaid) *Nature* is propor-

proportionably excited to, and invigorated for *Self-preservation*, sufficiently sollicites and enables it, by a stronger *Contraction*, to reject the *grieving Matter*.

As the greater the Relaxation is, the more is the Rest of all Parts; and the weaker the *Animal Spirits* (because less compressed) the gentler are all Motions, (as you see in *Sleep*,) consequently the less is the *Expence* of *Spirits*; so that in *Sleep* we generate more than we spend, and are thereby recruited: So the more the *Contraction* is, the more violent is the Motion of the *Heart*, *Intestines*, and of all Parts, and consequently the Expence of Spirits is the greater.

Therefore it can be no Wonder, That *Contractions* do cause great *Commotions of Spirits*, *Diary Fevers*, &c. when you consider,

1. That the *sensitive Soul* is, by the *grievous Sensations*, &c. that cause them, put upon a great *Fret*, *Concern*, and *Hurry*, to defend the *Animal*, and lays about him all manner of ways for *Self-preservation*.

2. That the *Animal Spirits* are, by means of great *Compression* caused by the *defensive Contraction*, in a very forcible *Springiness*, which causes all the Actions that are continual, involuntary, and of course, to be perform'd with great Violence, proportionable to its compressed Elasticity. Besides that,

3. The *Systoles* of the *Heart* are oftener repeated. All which conspire to cause greater *Commotions* upon *grievous Sensations*, whereby *Diary Fevers*, &c. are caused, which are easily and naturally cured by *Sleep*, or *Relaxation*, at present compose and quiet those *Perturbations*. Who knows (tho' it is not my *Business* to discuss it at present) but that the *Contractions* in the *cold Fits* of *Agues*, have a great hand

hand in causing the *hot ones*? How otherwise should *Opium*, by only taking away the grievous *Sensation* of the *cold Fits*, take off, or prevent the hot Fits also? But of this, in my often-mentioned *Tract*, (though not so often as it grieves me that it is not published.).

How reasonably may we now expect, That pleasant Sensation may cause quite contrary Effects to that of *grievous Sensation*? *viz.. Relaxation*, and all its *Effects*, (which have been in some measure enumerated in the Case of *Natural Sleep* in this *Chapter*) viz. *Satisfaction*, *Composure* of *Frets* and *Commotions*; as of diary *Fevers*, *hysterick Fits*, &c. *Perspiration*, *quieting* of *Vomitings*, *Hiccoughs*, &c. *lessening* of *Feeling*, and consequently a stop and *moderation of all Fluxes* that depend upon Irritation of Humours, as *Diarrhea's*, *Dysenteries*, *Catarrhs*, *Vomitings*, *Driness of the Mouth*, (as in *Sleep*, for want of the *Contraction* to squeeze the Spittle out of the Glandules into the Mouth) *Nocturnal Pollutions*, &c. But of the *Nature* and *Effects* of *Pleasure*, you'll find more in the next *Chapter*.

Besides the *Vigilative* and *Defensive Contractions*, (which seem to be Things of course upon *Waking* and *Grievances*) the *sensitive Soul* has a *Contraction* at *Will*, as that of the *Pupilla*, when an *Animal* is intent upon *Seeing*; of the *Tympan*, when intent upon *Hearing*; of the *Muscles* of the *Legs*, when intent upon *Walking*; and so of all the *Muscles* of the *Body*, which I call *Intentive Contraction*, that he can perform either along with, or without the other *Contractions*, or without any great *degree* thereof, as when one is considerably relaxed with the *Pleasure* of *Wine*, *very good News*, &c. nay, sometimes even in *Sleep*, as is manifest by the *Noctambuli*, (or such as walk in their *Sleep*) and such as speak,

ſpeak, ſtrike, &c. while aſleep: And as the *Defenſive Contraction* does all it can in our *Defence*, without the *Direction* of the Will, as in *Vomiting*, *Sneezing*, *Purging*, &c. upon *ſenſible Irritation*; ſo this *Intentive Contraction* does all it can to the ſame Purpoſe, by the *Direction* and *Dictates* thereof.

Note, That inſenſile growing Things that do not move, as *Trees*, &c. have none of theſe *Contractions*, but what happens by *Cold* and *Compreſſion* of the *Atmoſphere*, which are ſufficient it ſeems for *Nutrition*, but not for *Senſe* and *Motion*; it follows, That in compleat *Syncopes*, when the *ſenſitive Soul* gives over all *Contractions*, that we are much in the ſtate of a Plant.

All thoſe three Contractions, *viz.* the *Vigilative*, *Defenſive*, and *Intentive* do, becauſe they promote Motion, and cauſe it more or leſs, (as you find the *Vigilative* cauſes much more of it than *Sleep*, and the *Defenſive* more than that, &c.) ſpend the *Spirits*, cauſe *Wearineſs*, &c.

The *Vigilative Contraction* does of it ſelf, without any conſiderable *Grievance* or *Labour*, that is, without the *Denfenſive* or *Intentive Contraction*, tire the *ſenſitive Soul* in about 16 *Hours*: Hence it is that the idleſt Perſon, that is moſt free from *Care*, *Trouble*, or *Pain*, cannot well hold out without the Recruit of *Sleep* any longer.

The *Defenſive Contraction*, or that of *Grievances*, being added to the *Vigilative Contraction*, the Spirits are faſter ſpent, and the Perſon tired proportionably ſooner, according as the *Grievance* is *more* or *leſs*, and conſequently the Endeavours of the *ſenſitive Soul* to be rid thereof.

To

To both which *Contractions*, (*viz.* the *Vigilative* and *Defensive*) if you add the *Intentive*, (or *Labour*) then are you sooner and more tired than by only those two *former Contractions*; for this last Case is labouring in *Pain*, (or under a *Grievance*) which notoriously tires Man or Beast sooner than ordinary: The direct contrary to which, is sleeping soundly and sweetly, without Trouble, Pain, or Dreams; for a *dreaming Condition* has too much of the *vigilative Contraction* in it, to be pure *Relaxation* and *Recruit*.

Now according as these *Contractions* are, or are not added one to another, we are sooner or later before we are tired, (speaking generally, and not considering *Custom* and *Habit*, which concerns us not.)

You see that all the three *Contractions* concurring, do soon and sadly tire us, that no *two* of them tire us as much as the *three* together; that is, neither the *Vigilative* and *Defensive*, without the *Intentive*; nor the *Vigilative* and *Intentive*, without the *Defensive*; and the *Vigilative* alone least of all: Yet *allowance* must be made for the Intenseness of the *Defensive* and *Intentive*; for either of these two being very intense, may tire as much as both, in a moderate *degree*: Thus a Man may be tired with violent Labour in four Hours, tho' not in *Pain* as much as one that moderately labours in some small *Pain* for the same *time*.

Observe, That we recruit in eight Hours (generally speaking) as much by relaxation in *Sleep*, as we spend by *vigilative Contraction* in sixteen: I take the Reason of that to be, That *Relaxation* widening all the Passages of the *Body*, the Nutriment is admitted into them more fully and freely,

as

as the *Blood* is into the Skin in *Sleep*, and all *Relaxations*, which cause an *Efflorescence* thereof in those Cases. Hence it is that we are so much recruited and nourished in Sleep; that Children grow more than others proportionably, that Relaxers cause the *Breasts*, *&c.* to grow.

Note, What a mighty *Restaurative Relaxation* is! By its help, for *eight Hours* in *twenty four*, we can watch all, and labour most of the other *sixteen*, all the *days* of our Life: It follows, That if we could any *way* half relax the *vigilative Controller* while we *Labour*, take a *Journey*, or the like, that we might perform prodigiously, without being tired. Hence it is, That because *Pleasure* (as has been intimated *relaxes*, as *Grievances contract*, (of which you may expect further *Proof* in the next *Chapter*) that such as work, or travel, pleasantly diverted all the time, are tired very little or nothing in a long time; and that some will dance whole Nights with sweet Musick, and agreeable beloved Company, without being so much tired, as they would be if they us'd the same Motions for a quarter of the *time* without either of the *pleasant Diversions*. The like is to be said of any other *Pleasure*, as drinking a good *Glass* of *generous Wine* every *half hour*, or so often as to continue the *sense* of its *Pleasure* at *Stomach* all the time they *labour* or *travel*; for 'tis a *vulgar Error*, (tho' the universal Sentiment of Mankind, both Learned and Unlearned) That *Wine*, *Cordials*, &c. do comfort, elevate, and excite the *Spirits*, (as 'tis call'd) by adding their Spirits to, or joining them with ours; whereas it is only by causing a *pleasant Sensation*, particularly at *Stomach*: For which *Paradox*, I am obliged (tho' in great haste to come to the *Explication* of *Opium*) to give my Reasons, which are as follows, *viz.*

It

1. It cannot be imagined how a *ſenſitive Creature*, as ſuch, can conceive any *Comfort*, or be ſenſible thereof, but by *Senſation*: To ſay he is comforted, and not ſenſible of the *Comfort*, is a *Contradiction*; for *Comfort*, as ſuch, belongs to a perceiving *Being*; and an *Animal*, as ſuch, perceives nothing but by the *Senſes*; and therefore there can be no *Comfort* but by *pleaſant Senſation*; nay, as ſuch it is his *Comfort*: So *Muſick*, *pleaſant Sights*, *Odours*, and agreeable Objects of all the Senſes, are comfortable, becauſe *pleaſant*. I hope that none will ſay, That *Muſick*, *Sights*, *good News*, *&c.* (which highly comfort) have any *Spirits* to add to ours: The truth is, That *God* and *Nature* have given us our Senſes for that end, and preſent *Refection* in Caſes of *Faintneſs*, *Depreſſion* of *Spirits*; And what more proper to convey Comfort to us, than what is ſenſible of it?

2. It is another thing to add by way of *Nutrition* to our *Spirits*, (which are inſenſible Things, and therefore never properly comforted any more than a *Plant*, that is nouriſhed as well as they:) But the *ſenſitive Soul* being pleaſed, muſt needs conceive *Satisfaction*, *Comfort*, *Joy*, &c. How he can be pleaſed when ſenſible of nothing, I know not; nor how he can be comforted without being firſt pleaſed, nor how pleaſed but by *Senſation*.

3. The *Eſſence* of *Animal Comfort* does not conſiſt in having many *Spirits*; for one in moſt grievous *Pain* and *Miſery*, by which he is much diſcomforted, caſt down, depreſſed in Spirit, *&c.* may have great plenty of *Spirits*; and one that has not half as many, highly comforted, by pleaſing *Objects* of *Senſe*, *good News*, &c.

4. If we ſtaid for *Comfort* by a *Meal* of *Meat*, *&c.* till it added to our *Spirits*, we might ſtay long enough; nay, if we ſtaid for *Comfort* till we

We found it by that *Addition*, we ſhould never find it; for we cannot in that caſe find what we do not feel: We poſſibly, after two or three days eating and drinking, may find our ſelves ſtronger; but (after all) ſuppoſe us in very great miſery at the ſame time, Where's the Comfort of it, when the Spirits are otherwiſe depreſſed by *Pain*, *ill News*? &c.

5. Hunger is a *grievous Senſation* at Stomach; which is cured, and we comforted, by cauſing a *pleaſant Senſation* by *Meat*, *Wine*, &c. inſtead thereof; and not by adding *Spirits*, which is a great Miſtake. It is true indeed, that we are comforted, but it is moſt manifeſtly by pleaſing the *exquiſite Senſation* at *Stomach*, which *God* has placed there for that *End*: Hence it is that all *Cordials* muſt be pleaſing to the Stomach, or elſe they are no *Cordials*; and that *Wine*, and all ſuch Things as pleaſe the *Stomach*, are apt to take away much of the *Sharpneſs* of *Hunger*, for a time at leaſt.

6. How ſhould *Wine*, which has a great Acidity in it, and ſo very good for *Digeſtion*, cure a *canine Appetite*, which is a *grievous Senſation*, but by cauſing a pleaſant one in its room, by which means the *grievous Senſation* is taken off? For *Pleaſure* and *Grievance*, (or Diſpleaſure) which are *Contraries*, cannot be in the ſame *Subject* at one *time*. Thus it is that *Opium* takes off *Hunger*, *canine Appetite*, &c. But of this hereafter.

7. How ſhould a Quart of Wine, drank in a minute or two, have all the *comfortable Effects* of *Wine* in a *quarter* of an *hour* while it is at *Stomach*, if it were to ſtay for this Comfort till it added Spirits to ours, ſince the matter of *Effluvia*, or *Fumes* paſſing into the *Bloud*, is diſproved?

8. Why should our *Comfort* be so great while it is at *Stomach*, and none by that time it is got into the *Bloud*, but that the *Stomach* being very sensile, the Spirits of the *Wine* do highly please by their *Agreeableness* thereunto? It matters not whether it had Spirits or no, so it caused a *pleasing Sensation*; for a *Draught* of *Water* in a high *Fever*, and when we are very faint with *Thirst*, very much comforts us without any *Spirits*, as does a Venison-Pasty a hungry Person, by *agreeable Sensation* taking off the *grievous Sensation* (called *Hunger*) and all its consequent Faintness, *&c.* before it can add any *Spirits* by Nutrition.

9. What need we seek any farther? Do not we find a *pleasing Sensation* at *Stomach*, when we are comforted with any thing, and the *Comfort* to bear a *Proportion* to the *Pleasure*?

10. Are not we *prompt*, *blithe*, *gay*, and *brave*, while the *Wine* is at *Stomach*? And very often fit for nothing, *dull*, *heavy*, *mopish*, &c. by that *time* it is got into the *Bloud*?

Therefore we may safely conclude, That the *Spirits* of the *Wine* do comfort us, by causing a *pleasing Sensation*, and not by adding its Spirits to ours, according to the settled Sentiment of the World, that is not yet arrived to the *Learning* or *Knowledge* why the most common Cordial comforts them. What Spirits has a Grain of *Opium*, while at Stomach, to add to ours; or can it add, if it had them? Yet no *Wine* comforts us as much as *Opium*, because it pleases us so much, (as was and will be yet much more fully shewn.)

Note, That besides what was said of the Grievousness of the three *Contractions*, to tire the *animal* or *sensitive Soul*, he is much depress and cast down, upon the Perception of *Grievances*, as *Hunger*, *Pain*, &c. Because they, 1. Affect him with *Grief*

and *Displeasure*, and consequently with *Discomfort*, *Anxiety*, &c. because of the very *Dolour*. 2. With *Care* and *Solicitude* how to be rid of it. 3. With the Toil of *Defensive Contraction* to endeavour it.

All which causes *Melancholy*, *Depression* of *Spirits*, *Pusillanimity*, *Perturbations*, *Frets*, *Discomposure*, *Dissatisfaction*, *Anxiety*, *Solicitude*, *Peevishness*, *Discomposure*, *Discomforts*, *Listlesness*, &c. as you see in such as are *Hungry*, or in *Pain*; to which if you add the *Fatigue* and *Effects* of the *Defensive Contraction*, and the *Intentive*, as far as it is exercised for *Self-preservation* in this Case, you may (observing what has been said) easily solve all the *Phenomena's* of *grievous Sensation*, and as easily conclude what must be the *Phenomena's* and *Effects* of *pleasant Sensation*, by the Rules of Contraries, *viz. Satisfaction*, *good Humour*, *Ease*, *Comfort*, *Ovation* of *Spirits*, *Relaxation*, &c. of which we are going to speak.

CHAP. XIV.

Of the Nature of Senſitive Pleaſure, and its Effects upon the Animal, as far as it concerns our preſent Purpoſe.

Senſitive Pleaſure is a Complacency of the ſenſitive Soul, reſulting from the Agreeableneſs of the Object to the Organ of Senſation: Thus are we pleaſed with what is agreeable to the *Eye*, *Ear*, *Tongue*, *Stomach*, &c. And what is agreeable to thoſe Organs, is agreeable to the *Animal* in general: 1. Becauſe *God* has made and appointed them (eſpecially the *ſenſile Membrane* at Stomach) to be as it were the Touchſtone of what is agreeable to the *Animal*. 2. Becauſe the *Membranes* (or *Organs*) are of the ſame *active Principles* with the *Animal's Body* in general; otherwiſe they would not be fit *Taſters*, *Triers*, or *Touchſtones* of what is good or bad for the *Body* in general.

Now the *active Principles* of the *Membranes*, (or Organs) are *Volatile Salt* and *oily Parts*, or a *Sal Volatile Oleoſum*, which is predominant in them, and all the Parts of the *Body*; therefore ſuch Things as have a *Volatile Salt* join'd with ſome *oily Parts*, muſt be in a ſpecial manner agreeable and pleaſing to the *Membranes*; for *ſimile ſimili gaudeat*.

Hence it is, That what abound in Volatile Salt, as *Snails*, *Earthworms*, and Things of that *kind*, are ſuch fine *Anodynes*, and ſo pleaſing to the *Membranes*, &c. That the Seed of *Animals*, which is a *Sal Volatile Oleoſum*, and Things of that nature, as *Onions*, *Garlick*, *Rocket*, *Sives*, *Bears Garlick*,

lick, *Oysters*, *Cockles*, *Shallot*, &c. do so please and tickle the *Venereal Membranes*, and thereby *excite Venery*; and that such Things are generally so very agreeable to the *Stomach*, (with which we are mainly concerned, as the Chief Judge of what is agreeable to the *Animal*) and so main Ingredients of *Relishes*, *Sauces*, &c. to render them pleasing to it.

Here it is obvious to *note*, (what is also very commonly observed) That the most pleasing Things to the *Stomach*, *Venereal Membranes*, &c. have those *Principles* more active, warm, and tickling, than the *Membranes* themselves, because the *sensitive Soul* is highly pleased with what finely actuates, tickles, and causes an Ovation of the *Spiritus insiti* of the *Membranes*. Hence bare Warmth is so very pleasing, as are also gentle *Frictions* of the *Head*, *Back*, &c. for the same *Reasons*.

1. The oily Parts (as all know) do please the Feeling (with which we have to do) by their smooth, gentle, and soft touch. Thus Milk, Emulsions, and other *Anodynes*, as the Root and Flower of *Water Lily*, *White Lily*, &c. become agreeable to the *Membranes*, and therefore relax and ease *Pain*. Hence it is that all *Aliments* have an agreeable Sweetness, the Pleasure whereof takes off the grievous Sensation called Hunger.

But the *Pleasure* of oily Parts, because they do not so actuate, stir, and titillate the *Spiritus insiti*, is but flat, slow, and dull, without they are joined with some other Particles that are pleasing to the *Membranes*, that actuate and finely titillate the Membranes, and *Spiritus insiti*; therefore to make them highly and charmingly pleasing, they should have join'd therewith,

2. *Volatile Salt* being a more *active agreeable Principle*, which may finely and pleasingly excite, actuate, titillate, and cause an Ovation in the *Spiritus insiti*, as *Onions*, *&c.* at *Stomach*, *Sem. Animal.* upon the *Venereal Membranes*, *&c.*

But, as was said of the *Oily Parts*, That they cannot cause so exalted a *Pleasure* without the *Volatile Salt*, so the *Volatile Salt* alone, or too little qualified, and smooth'd over with Oily Parts, is too rude, pungent, or acrimonious, as in *Cantharides*, *Bees*, *Pismire*, *Asarabacca*, *Spear-wort*, *Crowsfoot*, and other *Vomitory Volatiles*, which becomes so by over-stinging the *Membranes*, and stirring the *Spiritus insiti* overmuch into a sort of *Fury*, instead of an *agreeable Ovation*.

It follows therefore, That it is neither *Oily Parts* alone, which if too much, often nauseates the *Stomach*, nor *Volatile Salt* alone, no nor every *Mixture* thereof, but a certain due *Proportion* of both, so as to have the *Volatile Salt* somewhat more predominant than in our Membranes, that it may comfortably *actuate*, *titillate*, and *excite* our *Spirits*, as *Warmth*, *Frications*, *&c.* do, must cause the most *charming* and *exalted Pleasure*; For Things exactly of the same *degree* of *Oil* and *Volatile Salt*, with our *Membranes*, can cause but a slow *Sensation*, because they make little or no *Alteration* therein, which is one of the great *Requisites* of *Sensation*; for that which makes no *Alteration*, as the *Saliva* in the *Mouth*, the same *degree* of *Light* that is in the *Eye*, of *Sound* as in the *Ear* already, *&c.* cannot be perceiv'd, because where no *Difference* is made, nothing can be perceiv'd, for the *Organ* is affected but as it was before the *Object* was offer'd, and consequently we cannot perceive that any new thing was objected, and therefore cannot be at all sensible thereof; so if it makes but

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a ſmall *Difference*, the *Senſation* can be but ſlow, and ſlight Proportionably, as of a little degree of *Light* more than is in the *Eye*, *&c.* for it is only that little that is perceived; for (as is notorious to all who underſtand any Thing of theſe Matters of *Senſation*) it is only the *Exceſs* of *Impreſſion* to what was upon the *Organ* before, that is perceived; for that is all that is *new* above what was thereon before, and therefore all that is to be, or can be perceived more than was before (as was ſaid.) Hence it is, that *Fleſh* or other *Things*, that have the *Sal-Volatile Oleoſum*, or the ſame *Principles*, that the *Membranes* of the *Stomach*, *Venereal Parts*, *&c.* have, in much the ſame *degree*, affect them but with a gentle *Pleaſure*. Therefore we muſt have ſuch a mixture wherein the *Volatile Salt*, as in *Semine Animali*, *Onions*, *&c.* is ſenſibly more active than in our *Membranes*, to actuate the *Spiritus inſiti* of the *Membranes*, and cauſe an Ovation therein, which is (as was ſaid of Comfortable *Warmth*, *Fricatione*, &c) very agreeable, and pleaſant to the *Senſitive Soul*, who looks upon ſuch as friendly and active Auxiliaries to our *Spirits*, whereas the other are as *lazy Friends*, wherein he takes not the like *Complacency*; You may perceive much of the Difference in this Caſe in *Muſtums*, (or new *unfermented Wines*) which indeed do lazily pleaſe by their *acceptable ſweetneſs*, but do not ſo *actuate* the *Spiritus inſiti* as the ſame *Oily Parts* when rendered *active*, *ſpirituous*, and nearer the Nature of *actual Heat* after *Fermentation*; which then being very readily actuated by the *Heat* of the *Stomach*, do briskly and chearfully return the *Kindneſs* by *actuating* our *Spirits*, and putting them into a pleaſing *Ovation*, of which I could give you a very pat and pregnant Inſtance in a Thing actuated into a very high degree of pleaſing by *Frication* and

Agitation, which was otherwiſe almoſt inſenſible; but Modeſty forbids me.

Note, How the ſluggiſh Oily Parts in *Muſtums* do, by being *ſpiritualized* by *Fermentation*, as it were, ſupply the place of *Volatile Salt* in *attuating*, and in ſome meaſure *titillating*, tho' not to that high degree as the more *poinant Volatile ſalt* in *Semine Virili*, and the *like*, becauſe the *Sulphureous Oily* Particles, however ſeparated, diſgregated, and ſet at at liberty by *Fermentation*, retain much of their ſmoothneſs, and never can arrive at the *titillating* Power of *Volatile Salts*, as is evident in *Ambrodiſiacks* upon the Account of *Volatile Salts*, as *Cantharides*, *Bees*, *Piſmire*, *&c.* which *Wine* in 100 times the quantity cannot equal in *Titillation*.

Nor is it enough to have the *Sal Volatile Oleoſum* duely qualified, as to the *Quantity* and *Quality* of both the *Oily* and *Saline Parts*, and theſe predominant, and of a fine brisk and gently tickling Activity;

But the *Oleous* and *Salino Volatile* Parts ſhould (to make a compleat and permanent *Pleaſer* of the *Membranes*) be very intimately combined, ſo as not eaſily to ſeparate one from the other, otherwiſe they will not duely conſpire and co-operate to cauſe the *Pleaſure*, but the *Volatile Salt* will act ſeparately as ſuch, that is *irritating*, and not finely and pleaſantly Tickling, as *Semen Humanum*, *&c.* wherein the Oil and *Volatile Salt* are firmly join'd together.

I therefore conclude, That the moſt excellent Thing to pleaſe the *Membranes*, muſt be ſuch as *Semen Humanum*, that is, not too *Oily*, (for then it

it would not sufficiently please by a fine *Titillation*, and actuating of our Spirits) nor too full of *Volatile Salt*, as *Mustard*, *Asarabacca*, *&c.* nor have too *acrimonious* a *Volatile salt* with too little *Oleous Parts* to correct it, for in both these last Cases the *Irritation* would be *grievous*; nor have the *Oleous* and *Volatile* loosely combined. But,

That it should be a *Sal Volatile Oleosum, wherein the* Volatile Parts *are brisker, and somewhat more active than ours, yet so corrected by* Oleous Parts *intimately combined therewith, as to render it of a most agreeable and pleasant Titillation, such as would please all Membranes, but especially those that have most accute Sensation, as the* Stomach, *and* Venereal Membranes, (both which *Opium* most sensibly pleases) which are ordered so to be for Preservation of the *Individuum*, and *Species*, the one to invite us to *Eat*, and the other to *Procreate*; But to satisfie you yet farther, as to the *Stomach*, which concerns us mostly,

Note 1. That the more *exalted* and *intense* the *Pleasure* is, the higher are its *Effects* upon the *Sensitive Soul* in pleasing, comforting, and elevating it; and upon the *Body*, in relaxing all the *Sensile Parts* thereof, as that of *Wine* is higher than that of *Mustum*, *&c.*

Note 2. That the better the *Organ* is disposed for *Sensation*, the higher the *Pleasure* or *Displeasure* is; for he that has his *Nose*, *Tongue*, *Ear*, *Membranes*, *&c.* ill disposed for *Smelling*, *Tasting*, *Hearing*, *Feeling*, *&c.* has not so much *Pleasure* in sweet *Odours*, good *Tastes*, *Musick*, *Pleasers* of the *Feeling*, *&c.* nor so much *Displeasure* in bad *Scents*, *&c.* It follows,

Note 3.

Note 3. That *cujus est Dolor ejusdem est Voluptas*, that is, the *Part* or *Membrane* that is capable of *intense Pleasure*, is so of *intense Pain* or *Displeasure*. For *Instance*, If the *Stomach* be capable of great *Grievances*, it is so of great *Pleasure*, God having distributed them also equally.

Note 4. That, since the great *Use*, *End*, and *Business* of *Sensation*, is to give *notice*, and inform the *Animal* of what is, or is not good and agreeable to it, it follows, that the *Wisdom* that made us would place the most exquisitely and critically disposed *Organ* (or *Membrane*) of *Sensation*, where such *notice* is most requisite and useful; and consequently there must be more *Pleasure* or *Displeasure* conceiv'd at Things agreeable or disagreeable, that the descending and relieving *Motions* and *Comfort*, may be proportionable.

Note 5. That such exquisite, exact, and nice Notice is most requisite at *Stomach*.

First, Because all our Nutriment, good and bad, is to pass that Way to be Judged of.

Secondly, Because it is the last *Part* that it arrives at before it receives a considerable change; for when it is changed, no such true and sincere *Judgment* can be given thereof, as could be before.

Thirdly, Because the Faults, Defects, or Negligences of the *Taste*, and the *External Senses*, are to be remedied and corrected there, or no where, therefore the *Stomach* is as the last Judge of *Appeal*, and should be most exact and infallible in *Judging*; or as the last inner, or *Main Guard* in a *Fort*, *Town*, or *Castle*, which if the *Enemy* pass, the whole is endanger'd, if not lost.

Fourthly, Because the Concern being so great, Sensation should be the more exquisite there, to excite the *Animal Powers* to make Defence, by repel

repelling, rejecting, or detruding the *Enemy*, which *Powers* (as has been intimated) are excited according to the *degree* of *Senſation*, eſpecially ſeeing there is no voluntary *Power*, or *Contraction* of the *Stomach*, but only the *Natural*, which is always excited by *Senſation* in ſuch Caſes, or not at all.

Fifthly, *Senſation* ſhould be *critical* and accurate at *Stomach*, to inform us preciſely when we ſhould Eat or Drink.

Sixthly, To inform us exactly when we have Eaten or Drank enough; for all this is done by *Senſation*.

Therefore *God* has placed a moſt Senſile *Membrane* at the *Stomach*, as moſt manifeſtly appears;

Firſt, By its taking, and giving notice of ſuch Minute *Things*, that no *Senſe*, *Part*, *Organ*, or *Membrane* can; for it takes *notice* of, and informs the *Senſitive Soul* (as has been ſaid) of the Vomitory Particles of the *Crocus* and *Regulus* of *Antimony*, which are ſo indefinitely ſmall, that no other *Membrane* or *Organ* of Senſation, but that at *Stomach*, can take notice thereof, becauſe the *Crocus* and *Regulus*, after they have afforded 1000 *Vomits* from their Bodies, are not ſenſibly diminiſhed either in *Weight* or *Bulk*; nor doth the *Stomach* take and give a ſlight, but very remarkable *notice* thereof, that is ſufficiently powerful to excite not only all the *Natural Powers* of the Part, and of all the *Auxiliary Muſcles* that uſually aſſiſt to *Vomit*, but to cauſe a *Contraction* (and that very often ſtrongly Convulſive) of all, or moſt of the *Muſcles*, and *Membranes* of the whole Body, ſo great is the *Sway*, or *Regimen* of the *Stomach*, by *vertue* of its *exquiſite ſenſility*.

Secondly,

Secondly, By its giving *notice* of *inimicous Particles*, and very tenuious *Effluviae*, that fly in the *Air*, which no Organ of *Sensation*, or *Membrane*, but that at *Stomach*, can observe. For *Instance*, Some that hate *Cats* very much, will know, that there is a *Cat* in the same *Room* with them, tho' silent, and shut up in a *Trunk* or *Cupboard*, where neither the *Eye*, *Ear*, *Nose*, *Taste*, or immediate *Feeling*, can be at all concerned or affected. That it is the *Stomach* that is affected, is apparent, (tho' a Thing not thought of;) 1. Because the *first notice* they have is plainly at *Stomach* by a a kind of faint *Distress*, not unlike a beginning *Nausea*; If the Curious will enquire, they will find it to be as I say. 2. Because all *Perception* of Material Things is by *Sensation*, and that it is evident no other *Organ* of *Sensation*, or *Membrane*, is concerned. 3. Because, if the *Cat* continues in the Room, and is not removed, they fall a Vomiting, or into *Anxieties* or *great Distresses* at *Stomach*, or *Faintings* and *Syncopes*, which are the common and known *Effects* of a grieved or oppressed *Stomach*.

Just so does it (tho' these Things are not, or not duely observed) take, and give notice of *Pestilential Effluviae*, which cause the like *Faintings*, or a kind of *Nausea* at *Stomach*; Thus People discern that they are (as they call it) *Plague struck*, and often fall (as in the Case of the *Effluviae* of the *Cat*) into dangerous *Deliquiums* and *Syncopes*, of which many in *Plague* Times suddenly dye, as Cat Haters would (for ought I know) if they continue long in the same Room with a Cat, as they do with *Pestilential Effluvias*; Therefore it were good presently to remove them from the *Place* wherein they were struck, because the *Air* (as the *Room* wherein the *Cat* is) is fill'd with the perni-

pernicious Particles; for you see in the Case of the *Cat*, that removing the Man or the *Cat* gives Relief, and it were better removing the *Man*, but that he is more Cumbersom, because the *Room* is already tainted with the *Effluvia*, and in the *Case* of the *Plague* it is only the Person that can be well removed. This proves how useful Removals may be, and how convenient in *Plague Time* it would be to remove to the *Windyside* of a *Town* or *City* that is tainted, according as the *Wind* changes, and how convenient *Winds* are to convey away the *Effluviums*, and good Stomachick Cordials, that are warm and pleasant, to fortifie the *Stomach*, and open the *Pores*, which all Things that cause a sense of *Pleasure* do, as *Wine*, *Spirits*, *&c.* to which if some good *Preparation* of *Opium* were added, it would be most convenient. How many *Stories* have we of Persons well fill'd with *Wine*, who wonderfully escaped *Infection*; I pray *God* this *Hint* may be improv'd to the *Preservation* of *Mankind*; Therefore I add, that much may be in a good *Quantity* of *Wine* in this Case; 1. Because, *Quod intus est prohibet alienum*, that is, *What is within hinders ingress of another Thing*. 2. Because the *Perspiration* will be the greater, both upon the Account of the greater opening of the *Pores* by the *Pleasure* of the *Wine*, and the greater *Quantity* of Matter to be perspired carry off the *venemous Particles*. 3. Because the *Sensitive Soul* is thereby much comforted, refreshed, and invigorated; but I would have the *Wine* so used, as to keep a continual *Warmth*, *Pleasure*, and *Comfort* at *Stomach*, which is the main Cause of all the good; I think a *Glass* every Hour, after taking 2 or 3 at first, may hit the Mark best, the Reason of which will appear hereafter.

Thirdly,

Thirdly, The *Stomach's exquisite Disposition* to *Sensation*, above all other *Organs* and *Membranes*, appears by this, *viz.* That the Offences of the other *Organs* of *Sensation* (even by their proper *Objects*) do often affect the *Stomach* more than those very *Senses* or *Organs* themselves. For *Instance*, If we smell a great Stench, the *Stomach* is often more offended thereat than the *Nose*, as is manifest from the *Vomitings*, *Faintings*, and *Deliquiums* that are caused by the *Stomach* upon that *Account*; so the bare *Seeing*, *Feeling*, and *Tasting* of a nasty Thing, do cause *Nauseas*, *&c.* at *Stomach*, yea, the very naming of such Things has much offended it, and caused such *Effects*, which may be thought very strange, considering that there pass no *Effluvias* from the *sound* of *Words*, but the *Reason* will appear in the following *Paragraph*.

Fourthly, All *Passions*, *Commotions*, and *Perturbations*, that happen in the Body, do often affect the *Stomach*, and sometimes so grievously, as to cause *Nauseas*, *Vomitings*, great *Anxieties* at *Stomach*, *Faintings*, &c. Thus *Fear*, *Terrour*, *Surprizes*, *Anger*, *Grief*, *Pain* in other Parts, *&c.* causing some Motion in the *Animal* more than ordinary, (of which the *Stomach* being sensible) do cause the aforesaid Disturbances; Therefore it is no *Wonder*, if the *Hearing* one mention a Nasty Thing, which causes an *Abhorrence*, and the Motions consequent thereunto, should (as was said in the precedent *Paragraph*) cause the nice *Stomach* to be offended.

It is most manifest from the Premises, that no *Organ* or *Membrane*, can compare with the *Stomach*, as to its *exquisite Disposition* for *Sensation*; it follows then,

That

That Grievances or Pleasure at Stomach must have the greater Effects;

1. Because the Intenseness of either will be proportionable to the *Sensation.*

2. Because the *Powers* of the *Animal* that are to defend it (which are *Contractions*) are affected according to the *Sensation,* and that it is there most requisite sensibly to affect them.

3. Because what affects the *Stomach* influences the whole *Animal,* more than the *Sensation* of any other Part.

4. Because of the considerable Stay that Things make at *Stomach* to cause *Grievance* or *Pleasure,* whereas that of *Pleasure* is generally very momentary in other Cases.

5. Because, being within the *Body,* we carry our *Pleasure* or *Grievance* with us, (as a *Vade Mecum*) wherever we go, and therefore,

6. It is a *Pleasure, &c.* that cannot so well be taken away from us, as that of the *Tongue, Ear, Nose, Eye, &c.* may, by removing the *Objects*; and therefore it remains with us in our very *Sleep,* as far as we are capable of *Sensation* at that Time, causing pleasant *Dreams, &c.* and so agreeably entertaining us *Sleeping* or *Waking,* when the Pleasure of all the other *Senses* fails us. Which will appear farther hereafter.

The *Pleasure* at *Stomach* excells even that of *Venery,* if not in *Intensenes,* yet in several other *Respects, viz.*

1. Because of its *duration,* that of *Venus* being *momentary,* but that of *Wine* at *Stomach* lasts a good while, and that of *Opium* many hours, 'tis therefore that the *Effects* of these Two are more remarkable and taken notice of.

2. Be-

2. Because, that at *Stomach* may be continued as long as we please, by a new supply of *Wine*, *Opium*, *Cordials*, *&c.*

3. Because it may be excited, when, and as often as we please, if we have those *Cordials* at *Hand*.

4. Because it is not attended with any Expence of *Strength*, *Depression* of *Spirits*, *&c.* as that of *Venery*, but the quite contrary, *viz.* with more *Vigour*, *Elevation* of the *Spirits*, *&c.* one being by *Emission*, and the other upon *Admission* of what is *agreeable*.

It is for the *several Reasons* contain'd in the *Premises*, that the *Effects* of *Grievance*, as *Hunger*, *&c.* or *Pleasure*, are more *considerable* and *remarkable* at *Stomach*, and that Things agreeable thereto have, by way of *Eminence*, gain'd the Name of Cordials; That *Wine*, *Spirits*, *Opium*, *&c.* do cause a more permanent and notable *Gaity*, *Pleasantness*, *Good Humour*, *Serenity*, *Promptitude*, *Ovation of the Spirits*, (or *Sensitive Soul*) *Bravery*, *Courage*, *Magnanimity*, *Euphory*, or easie undergoing of *Business*, *Relaxation*, with all its Effects, as *Deadness of the Eye*, *Dilatation of the Papilla*, *Perspiration*, &c. which are hardly noted in other *short Pleasures*, unless it be in that eminent (tho' short) one of *Venus*, which is a *Pleasure* of the same *sense* of *Feeling*, as that of *Opium* and *Wine* are.

Therefore pleasing the *Stomach* is one of the greatest Things to be regarded in the *Practice* of *Physick*, to Comfort, Satisfie, or Compose the *Spirits*; by which Means I have often performed such Cures, that neither I, nor (I suppose) any other, could otherwise perform, namely, *Dejections of Appetite*, *Untowardness at Stomach*, &c. when

when all the ordinary and usual Means have failed, by asking them what they mostly desired or long'd for, and letting them have it; or if they could not tell of any Thing that they long'd for, I have mentioned to them all the Relishing Things that I could think of, and such as were grateful to the Stomach, till they fasten'd upon somewhat that they liked or fancied, and then being given them, it generally had the desired Success.

The *Stomach* is grieved (for it will concern us to know how, because *Opium* causes *Vomiting*, &c.) generally speaking;

1. *By Things hard of Digestion*, as heavy *Bread*, *Mushroms*, *Rosins*, and such like.

2. *By Things acrimonious or pungent*; as Vomitories of *Asarabacca*, *Groundsil*, *Squills*, &c. which abound with *Volatile salts*.

3. *By Things that stick to the Stomach*, which often cause most dismal and tedious Vomitings, and (when they fail to relieve, by rejecting the *grieving Matter*) *Hiccoughs*, *Anxieties*, *Distresses*, *Syncopes*, and sometimes fatal *Succumbencies*, *Nature* and all *Endeavour* failing to work any farther for the *Animal's Relief*; These Things happen most commonly when indigestible Rosin sticks to the *Stomach*, especially if they be join'd with any *Pungent*, *Volatile*, or *Acrimonious Particles*. Hence it is, that *Resinous Vomits* are quite banish'd out of the *Practice* of *Physick*, and it were well if *Resinous Purgers* were so also, especially such as have considerable *Acrimony*, unless given with the *Yelk* of an Egg, *Lixivials*, or in *Tinctures*, with *Spirituous* Things to keep the *Resinous Particles* from *Coalescence*, and adhering to the *Stomach*, &c.

1. *Note*, (for we shall have some Occasion for it) That Resinous Things, join'd with *Volatile* irritating *Particles*, have all the ill *Qualities* aforementioned, *viz. Hardness of Digestion*, *Aptitude to stick* to the *Stomach*, and *Volatile Particles* to irritate and tear its *Coats* all the *time* they so stick to it; and therefore such Things have dismal *Effects*, especially in weak *Stomachs* that cannot *Digest* them.

2. *Note*, That the *Distresses* at *Stomach*, caused by a *grievous Sensation*, are of Two sorts; 1. Such as are the *Endeavours* of *Nature*, or the *Sensitive Soul*, in Defence of the *Animal*, as all *Vomitings*, *Purgings*, *Convulsions*, *Hiccoughs*, *Throws*, *Strugglings*, *Agitations*, *Contractions*, *Watchings*, *&c.* which are accompanied with *Melancholy*, *Fretfulness*, *ill Humour*, *&c.* because of the *Grievance*. 2. Such as follow the Yielding and Succumbency of Nature, or the *Sensitive Soul*, after being tired and over-born by the *Fatigue* of *Defensive Contraction*; as *Faintings*, *Distresses*, *Agonies*, *Syncopes*, and *Leipothymies*.

3. *Note*, That *Syncopes*, or *Leipothymies*, are caused by the *Sensitive Soul*'s being over-born, (as was said) tired, and spent, and giving over his fruitless *Contractions*, *Defensive*, and *Vigilative*, upon a sudden, as being to no *Purpose*, as he does gently and gradually give over *Vigilative Contraction* to cause *Sleep*; so that *Syncopes* are only greater, suddener, and more absolute *Derelictions* of the whole Concern of *Contractions*: Hence it is, that *Perspiration* is greater in *Syncopes* or *Leipothymies* than in *Sleep*, the *Laxity* of the *Cornea* and the whole Body greater, the *Feeling* less, or quite gone, that all *Motions* become much slower, or none, by the want of *Compression* of the *Animal Spirits*, and dismal *Derelictions* of all *Contractions* by the *Sensitive Soul*. Hence it is, that all the Effects of *Sleep* are yet greater in *Syncopes*.

4. *Note*,

4. *Note*, That therefore it seems, all the *Difference* between *Sleep*, and a *Leipothymy*, is, that in this the *Sensitive Soul* quite throws the Reins of *Contractions* away, and in *Sleep* keeps hold thereof, and only lets them *loose*, and as *Refection* is made, straightens them more and more, till they come to the *Degree* of *Vigilative Contraction*, which perfectly awakes them; Therefore Sleep grows slighter toward Morning, because *Contraction* gradually comes on. Here you may see (but I must stop lest I run too far) why every Thing that causes *Contraction* of the Sensile Parts, as *Pain*, and all *Grievances*, are apt to awake People, and keep them so, as *Relaxers* cause *Sleep*, and continue it.

5. *Note*, That tho' I have particularly spoken of the *Stomach*, as being most concern'd, and the best *Example* of any *Membrane*, yet do not I exclude any *Membrane* from being capable of *Pleasure* by the like Things.

As for the Effects of Pleasure upon the Sensitive Soul, I have upon several Occasions said, or intimated enough concerning them; and even the *Vulgar* know, that *Pleasure*, or being pleased, makes *People* good, and gay humour'd; That it elevates the Spirits, raising Courage, (as Wine does) and enables every *Animal* to Labour, or Travel the better, as *Horses* by the Sound of *Bells*, especially if tunable, and in *Company* with *another Horse* that they have a kindness for; How *Soldiers* March more easily with *Merry Comrades*, that are full of *Jests*, and *pleasant Stories*, or with *Drums*, *Trumpets*, *Kettle Drums*, *Hautboys*, and other *Musick* that please the Ear; How much more *brisk* and *blith* are we in a fair *Sunshine*, which pleases the *Eye*, than at other *times*? Some think, (according to the *Vulgar Errour*) that it

is the *Goodness* of the *Air* does it; but it is plainly otherwise, for you find the change most remarkable in your self just upon going out of *Doors* into the Sun-shine, whereas you had the same *Air* in your Chamber; nor is that fine *Lightness* of *Humour* to be found, if it be Cloudy, tho' the *Air* be better, as may be observ'd by the *Barometer*, and other *Weather-Glasses*; nor in the *Night Time*, nor where the *Sun* does not come, nor are blind People so affected, therefore it is the *Pleasure* of the bright *Sunshine* that causes it.

If Mean, Slight, Transient, and External *Pleasures*, cause such *Effects*; how much more then will an *intense*, *internal*, and *continued Pleasure*, upon the most exquisitely disposed *Part* for *Sensation* of all the whole *Body*, which is mainly design'd for those Purposes of *Pleasing* and *Comforting*, to invite us to nourish our selves, and to satisfie the *grievous Sensations* of *Hunger* and *Thirst* by the *Pleasure* of *Meat* and *Drink*, such Pleasant Effects? Thus the *Fretfulness*, *Peevishness*, *ill Humour*, *Melancholy*, *Pusillanimity*, *Inaptitude*, and *Listlessness*, that attend the *grievous Sensation* of *Hunger*, are taken off, and cured, by the *pleasant Sensation* that a *good Meal*, or some *Glasses* of *Wine*, do cause; Hence it is that we cannot Sleep when *Hungry*, because *grievous Sensation* contracts the Sensile *Parts*, and are apt to it after Meals (the Pleasure of which relaxes us) if we sit, or lie quietly, and silently; but if we do not, we are more lively, and fit for Business. *Instances* of this *Kind* are so numerous and *notorious*, that I need say no more of the *Effects* of *Pleasure*, in causing *a good Humour*, *Elevation of the Spirits*, *Satisfaction*, *Content*, *Composure*, *&c.*

Is

Is it possible that one should be *highly pleased*, and not *take Comfort* therein; *take Comfort*, and not be *elevated* in *Spirit*, well satisfied, and contented?

Therefore it is *strange*, and *very strange*, that People should leave *Wine*, *Cordials*, *Meats*, *Spirits*, *&c.* actually, and sensibly pleasing, satisfying, and comforting us at Stomach, (where there is a *Membrane* most exquisitely disposed for *Sensation*) and run after *Fumes* and *Effluviae*, (that were never in our Case in being) to the *Brain*, or *Blood*, that have no sense to entertain them, and consequently can receive no *sensible Comfort* by them; If this be not seeking a *Needle* in a Bottle of Hay, where it never was, when it sticks most sensibly in their *Fingers*, nothing is. We should think it a strange ridiculous *Action* in a *Child* or *Natural Fool*; but great is the *Privilege* and *Authority* of the Learned! So much may suffice as to the Effects of Pleasure upon the *Sensitive Soul*.

As for the Effects of Pleasure upon the Body, it is Relaxation of all the Sensile Parts thereof, as appears;

1. Because it's contrary, *viz. Displeasure*, or *sensitive Grievance*, causes *Contraction*, (as has been manifestly shewn.)

2. Because it causes a liberal *Perspiration*, which is a *certain Effect* of *Relaxation*, (as the Want of it is of *Constriction*) and that it causes Perspiration is most certain by *Statick Experiments*, and *Demonstrations*. *Sanctorius*, *Sect.* 7. *Aph.* 19. *&c.*

3. Because the *Pleasure* of *Wine*, and the *Venereal Act*, manifestly loosens all the *Limbs*, as *Sleep* does.

4. Because, that in those *Pleasures*, as also upon the sight of a Beloved Mistress, *&c.* the *Eyes* look *deadish*, by reason of the Laxity of the *Cornea*, and that the *Pupilla* is dilated.

5. The Skin (as has been intimated) looks *Florid*, which made the *Ancients* say, That the Blood and Spirits came outward to meet the *good* and agreeable Things.

6. Because all *Pleasure* that is consistent with *lying* or *sitting still* in a silent quiet manner, inclines us to *sleep*, as *Musick*, *pleasant Frication* of the *Head*, *Back*, or any *itching Part*, sweet and acceptable *Odours*, a *Thing* of very acceptable taste held in the *Mouth*, *Wine*, *Meats*, *Venus*, the *pleasant sound* of the fall of *Waters*, *Whistling Winds*, *Rocking*, *Undulating* in *Hammocks*, *&c.*

7. Because in *Coition* it relaxes the Neck of the *Womb* to admit the *Animal Elixir Vitæ*; of which we have most evident *Proof*, and some *eminent Instances*, that I forbear the Relation of out of Modesty.

8. Pleasure causes a large and wide *Pulse*, as *Relaxation* always does.

9. A Loss or great Diminution of Sensation, as in the *Venereal Act*, (which if it were of continuance, would exactly imitate *Opium* in its Effects) upon *Drinking Wine*, *&c.* the Effects of which being of greater *duration*, and by taking somewhat into the Stomach, (as *Opium* is) are very like that of *Opium*.

10. Intense *Pleasure*, *Joy*, *&c.* do frequently cause *Ecstasies*, *Syncopes*, *Leipothymies*, which are only great *Relaxations* (as has been shewn.)

11. You see that the Pleasure of Wine causes *Faltring* of the *Tongue*, which is the Effect of *Relaxation*, as in *Sleep*, *Palsies*, *&c.* and relaxes the whole Body.

12. Wine

12. Wine also prevents Lassitude, (as all pleasant *Diversions* do) and causes all the *Effects* of *Relaxation*, as taking away *Pain*, causing a *Deadness* of the *Eyes*, *Dilatation* of the *Pupilla*, *Floridity* of the *Skin*, *Perspiration*, *Diminution* of *Sensation*, *Mirth*, *good Humour*, *Sleep*, *&c.*

Note, That *Pleasure* being generally from External *Objects*, and also short, slight, and transitory, is the true Reason of the great *Penury* of Things that bear any compleat *Analogy* to *Opium* in its great *Effects*, which made it seem more amazing, and confound People; whereas all the *Difference* is nothing but its causing an *internal*, *intense*, and *permanent Pleasure*: All *Pleasures* have the same *Effects*, but that they are short, slight, fading, external, inconsiderable, intermitting, interrupted by some grievous *Objects*, *Thoughts*, *Passions*, as Fear, Care, Solicitude, Melancholy, *&c.* but the *Pleasure* of *Opium* we carry within us continually, whether we will or no, waking and sleeping, without any intermission or interruption, and that in a high degree for many hours.

Doubtless that of *Venus*, if it were half as lasting, would be as dangerous as that of a great Dose of *Opium*, or Wine drank in a vast Quantity, which is in a manner as dangerous as *Opium*, and for the same *Reason*, *viz.* by overdosing, a great *Relaxer* by the *Pleasure* it causes.

The Causes why the *Pleasure* of the *Venereal Act*, as a large *Dose* of *Wine*, *Opium*, *&c.* take away *Pain*, are;

1. Because the *Sensitive Soul* cannot attend to Two Things at once; therefore when a Sense of Pleasure is introduced, there cannot be at the same time a Sense of *Pain*, which tho' not noted in *short*, *transient*, and *desultory Pleasures*, (as almost all are besides that of *Wine* and *Opium*) yet the more permanent do exact our *Notice* and *Attention*,

tention, because they exclude Pain for so considerable a time that they amaze us.

2. Because the *Sensitive Soul* attends more willingly to *Pleasure* than to *Pain*, so that Pleasure engrosses his *Attention* (as was intimated.)

3. Because *Pleasure* and *Pain* (or *Displeasure*) are Contraries, and cannot co-exist in the same Subject (or *Sensitive Soul*;) therefore when *Pleasure* affects it, *Pain* cannot.

4. Because *Relaxation* (which is the *Mechanical* and *main Reason*) gives such Liberty to the *Animal Spirits* to expand, that they become unfit for want of Compression, to convey any Impressions smartly, which is requisite to cause a *sense* of *Pain*, that is caused by a smart *Impression*. To which you may add, That

5. *Pleasure* and *Relaxation*, where they continue, (as in the Case of *Wine* and *Opium*) do highly improve one another, because they mutually cause one another; for Pleasure causes *Relaxation*, and *Relaxation*, as you find in a sweet Slumber, *&c.* *Pleasure*; so that permanent *Pleasure* must highly advance *Relaxation*, which takes away *Pain* by preventing all *smartness* of *Impression* by the now *yielding Nature* of the expanded *Animal Spirits*, which are, as *Air* in a Gut half full, or a Rowl of Carded *Cotten* or *Wooll*, fit only to carry a gentle, or no Impression to the farther *End* thereof.

So that upon the giving of *Opium* when the *Pain* does once begin to diminish, it is not long afterward before it goes quite off; for if the *Pleasure* does but take off *one* in *ten* of the *Pain*, it is a sign, that it will be an easie matter for it (that is, upon the *Improvement* for the *Reasons* aforesaid) to overcome *one* in *nine*, and yet much easier to overcome *one* in *eight*, and so on; Therefore it is a certain *sign*, that you have given enough to take away

away the *Pain*, if it once ſenſibly decreaſes; and conſequently all *Phyſicians* ſhould then not give any more *Opium*, tho' the *Pain* is not yet quite off: For if the *Relaxation*, cauſed by *Pleaſant Senſation*, was of force enough to overcome the greater *Contraction* by the greater *Pain*, which oppoſed it more ſtrongly, it will ſuffice to overcome the leſs. This intimates, (and 'tis Experienc'd) that *Doſes* muſt be proportioned to the *Pain*; for tho' a few *Glaſſes* of *Wine* may take off the ſenſe of a *ſmall Pain*, more muſt be drank to take off a greater; and ſo of *Opium*, becauſe the *Contraction* by *Pain* reſiſts the *Relaxation* by *Pleaſure*.

Having ſhewn how *Sleep* and *Pleaſure* take away *Pain* by *Relaxation*, permitting the *Animal Spirits* to expand, and grow unfit to carry *Impreſſions* ſmartly, and that therefore *Sleep* ſtops or moderates all *Fluxes* that depend upon *Irritation* of the *ſenſile Parts* to cauſe them to Contract and ſqueeſe out the *Humours* that cauſe the *Flux*, while the ſame *Relaxation* opens the *Pores*, and ſo lets out the *Fumes* of the Body, which only (like Smoak in a Chimney) require an open Paſſage by reaſon of their *Levity* which carries them off; it plainly appears how *Pleaſure*, that takes away the ſenſe of *Pain* or Irritations by the like *Relaxation*, muſt ſtop the firſt ſort of *Fluxes*, that require the *Irritations* to contract the *Parts*, and promote that of *Perſpiration*, (as in Sleep) which requires only the opening of the *Pores*; ſo that I need add no more *Words* about it, for the ſame *Cauſe* muſt have the ſame *Effect*, therefore an *intenſe* and *permanent Pleaſure* muſt have all, or much of the *Effects* of *Sleep* in general (as has been ſhewn:) It cannot therefore be any Wonder that *Opium* cauſes Sleep. Yet is there *Difference* between *Sleep* and *Pleaſure* upon other Accounts, tho'

not

not upon the Account of *Relaxation*, *viz.* because;

I. That *Sleep* requires also a rest of *Spirits*, (or the *sensitive Soul*) whereas *Relaxation* by *Pleasure* is consistent with motion of the Spirits, either by *outward Action*, or *internal motion* thereof, by some *inward Causes*. Hence it is;

First, That we can *Labour*, *Travel*, *Dance*, &c. and enjoy *Pleasure* and its *Relaxation*: *Voluntary motion*, which requires only a particular *Contraction* of some Parts by the *Dictates* of the *Will* or *Appetite*, being consistent with the *general Relaxation* by *Reason* of the *Prerogative* of the *Will*. Thus do we move, tho' more relaxed, or when most Merry and pleased with *Wine*; nay, some will walk in their *Sleep*, (when extreamly int nt upon a Thing) as when awake; which shews the *ruling Power* of *intentive Contraction*, that may be exercised with *Relaxations* and other *Contractions* as the *Will* it self may, or *intentive Appetite*.

Secondly, That *Pain* is often taken away by *Opium* by the *Diversion* and *Relaxation* caused by *Pleasure*, and its *Inconsistence* with *Pain*, without *Sleep*, which requires the aforesaid *Rest*; That bare *Relaxation*, as such, does not include, tho' *Relaxation* suffices to take away *Pain*.

Thirdly, That *Opium* does by its *Heat*, *active Particles*, *&c.* hinder some Persons to Sleep, yet have you in both these last Cases all other *Effects* of *Opium*, as *Pleasure*, *Indolence*, *Relaxations*, &c. which shews how far *Sleep* is from being a *constant*, and the most *genuine Effect* of *Opium*, as is generally imagined; however we must allow it (as has been shewn) to be a mighty *Disposer* of us towards *Sleep*, because of the *Relaxation* that it causes, which is the main *Requisite* of *Sleep*.

II. That

II. That *Pleasure* does, without *Nutritive Refection*, by the Complacency it causes in the *sensitive Soul*, produce *Comfort*, *Satisfaction*, *Composure*, *Elevation of the Spirits*, *Euphory*, *&c.* of which Sleep is either not at all capable, or but in a *low degree*, proportionable to the *sensation* that it has, which is but little; however a *Pleasure* that remains within us, even in our *Sleep*, as that of *Opium*, may well cause Pleasant *Dreams*, *&c.*

The *Reader* may *observe*, that in all *Places*, where I mention, that *Relaxation* causes the opening of the *Pores*, that I speak only of *Perspiration*, as the *Effect* thereof, without mentioning *Sweat*.

1. Because *Perspiration* is the only *constant* and *infallible Effect* thereof, by reason that the *Levity* of the *Fumes* causes them as certainly to pass at the *Pores* when open, as *Smoak* passes up at an open *Chimney*.

2. Because *Sweat* is an *uncertain Effect* thereof, for it requires that the *Body* be well fill'd with moisture, tho' there is a *Relaxation* or *Opening* of the *Pores*; as *Hippocrates* very rightly intimates in that *Aphorism* of his that I cited in the last *Chapter*. 1. Because *Sweat* has not that *Levity* that the *Fumes* have, to cause it readily to move as soon as the *Pores* are open. 2. Because *Relaxation* is more apt to *receive*, *detain*, and *suspend Humours*. 3. Because the protrusive Motion of the *Heart* is weaker in all *Relaxations*; and all see how much its *Vigorous Protrusion* contributes to *Sweat* upon *Action*. 4. Because a *Heartfull* of Bloud does not make such a *Push* forward when the *Arteries* are widen'd by *Relaxation*. 5. Sweat having more of Continuity, Consistence, and Viscidity, cannot flow out so readily at the Pores, as

a

a meer Vapour. However, if the *Body* be full of *Moiſture*, and the *Pores* open, there being a Natural Courſe that *Way*, and the *Heart* continually protruding it farther and farther, a *Sweat* follows, and that whether they Sleep or not.

3. Becauſe *Sweat* (as was in ſome ſort intimated) is ſometimes cauſed by the *ſtrong Protruſion* of the *Heart*, as in *Motion*, *&c.* and upon that *Account* comes more under the *Title* of *Fluxes* cauſed by *Contraction*, than *Relaxation*, of which *Perſpiration* is a conſtant Effect.

4. Becauſe *Sweat* is ſometimes cauſed by another ſort of *Contraction*, *viz.* the *Compreſſion* of the whole *Body* by a violent *Defenſive Contraction*, as in *great Terrour*, *Agonies*, and the like; cauſing thereby (as was ſhewn) by the Compariſon of a wet Sheet wrung, (whoſe out *ſide* is cold) a *cold Sweat*, which that of *Alum* or *Vitriol*, cauſing an *Exudation* of the *Spittle* into the *Mouth* by conſtringing the Parts, does illuſtrate very plainly.

Therefore you ſee I had juſt Cauſe not to mention *Sweat* as a certain and proper *Effect* of *Relaxation*, without good *Diſtinctions* firſt made; tho' unwary *Authors* that talk any Thing one after another, not knowing what they ſay, make it their common ſaying, That *Sleep* and *Opium* ſtops all *Fluxes* but *Sweat*, whereas they ſhould have rather ſaid, but *Perſpiration*; for *Opium* and *Sleep* alſo will ſometimes hinder *Sweat*, *viz.* that from *Pain*, *Terrour*, *&c.* and that as happens juſt upon awaking by the ſtronger *Syſtole* of the *Heart*, and *Contraction* of the whole Body, and that alſo upon motion, unleſs the Body be (as was ſaid) full of *Humours*, or Moiſture. Therefore it is a *Vulgar Errour* to ſay *Sweat* inſtead of *Perſpiration* in the Caſe aforeſaid.

You

You may remember, that in the *Beginning* of this *Chapter* I concluded, that a *Sal-Volatile-Oleosum*, such as *Semen Humanum*, wherein the *Oily* and *Volatile Parts* are strictly combined, and the *Volatile* somewhat more *active* (or *acrimonious*) than that in our *Membranes* in general, must be most pleasing to the *Membranes* by a fine *Titillation*, *&c.* therefore if *Opium* should prove to be such, we need not wonder at its titillating to *Venery*, nor indeed its causing a *high* sense of *Pleasure* upon any *Membrane*, (they being all of the same *Nature*) but especially upon the most exquisitely disposed *Membrane* of the *Stomach*, and the *Venereal Parts*, nor consequently its causing all the aforementioned *Effects* of *intense Pleasure*, as *Comfort*, *Satisfaction*, *Ovation*, *&c.* of the sensitive Soul, (or *Spirits*) and *Relaxation* of all the *sensile Parts*; which will easily solve all the *Phenomena* of *Opium*, however numerous, mysterious, and seemingly contradictory, as you'll find.

Let us therefore now see, *whether* Opium *be such a* Sal-Volatile-Oleosum, *wherein the Volatile Particles are somewhat more active or acrimonious than ours*; *and the Oily and Volatile Parts strictly combined?* If so, the *Business* is done, the Nail is hit on the *Head*, and I may say Εὑρηκα.

CHAP.

CHAP. XV.

Shews what are the Principles of Opium, *and which cauſe the good and bad Effects thereof.*

HAving tried (if not tired) your Patience, and premiſed what I thought neceſſary in the foregoing *Chapters*, I now reaſſume the Thread of my *Diſcourſe*.

As for the *paſſive Principles* of *Opium*, which do or ſignifie little or nothing, we need not be ſolicitous, only tell you that it has much of *Earth* and *Water* in it, and more or leſs of *that* according to its *Foulneſs*, and of *this* according to its *Moiſtneſs* or *Drineſs*; and that it always has more *Water* in it in *moiſt Weather*, for I never knew any Thing ſo apt to take in moiſture, and to alter accordingly in its *ſubſtance*, (tho' not in *vertue*) inſomuch, that I have uſed it as an *Indicator* of the *Weather*, and it never fails to ſhew the *degree* of *moiſture* in the *Air*, if it be kept in a convenient Place, where Accidents, as the *Sun*, *Fire*, *&c.* may not alter the Caſe, and always in the ſame Place.

Our Buſineſs therefore being to enquire after the *active Principles of Opium*, I ſhall proceed in this Plain and Natural Method, *viz.* I ſhall Enquire;

1. Which *are the predominant active Principles of Opium?* And how combined, *&c.*

2. Which

2. Which *of them produce the good and laudable Effects of* Opium? *And why?*

3. Which *of them produce its ill Effects? And why?*

I. As to its *active Principles which are predominant.*

First, It manifestly appears, That *Opium* is highly impregnated with *Volatile Salt.*

1. By its *biting*, and *pungent Taste*, which is the certain *Effect* of *Volatile Salt*; as in *Mustard*, *Horse-Radish*, *Cresses*, *Arum*, (or *Wake Robin*) *Scurvigrass*, *Rochet*, *Spearwort*, *Crowsfoot*, *Squills*, *Radish*, *Arsmart*, *Onions*, *Garlick*, and very many Plants of the same *Kind*, which have their *biting*, and *pungent Taste* (as all know and allow) from their *Volatile Salt*; and so have all Plants of the like *Taste*, which are therefore commonly esteem'd to be *Antiscorbuticks.*

2. By its *rank* and *vehement Smell*, being such, as is by the common Consent of the Learned always attributed to *Volatile Salt* alone, or join'd with some *Oily Parts*, as the smell of *Semen Virile*, (to which I take that of *Opium* to be most like) of *burnt Hoofs*, *Horns*, *Skins*, *Membranes*, *&c. Garlick*, *Onions*, *Rocket*, *Pismire*, *Soot*, *&c.*

3. By its ready *Dissolution in Water*, *moist Air*, *&c.* which must be from its *Volatile Salt*, because it has very little Fixed Salt, and because *Volatile Salt* is the most dissolvable Salt that is in Vegetables before they have passed the Fire.

4. By its *Dissolution in Spirit of Wine*, which *Volatile Salts* are more apt to do than Fixed Salts; and this is one *Reason* why it is so apt to dissolve in all *Menstruums*, especially the Three main ones,

ones, *viz.* The *Watery*, the *Salino-Volatile*, (as *Spirit of Salt Ammoniac*, *Spirit of Harts-Horn*, *&c.*) and the *Spirituo-Sulphureous*, as *Spirit of Wine*, *Brandy*, *&c.* in which last Things its *Sulphur* that is join'd with the *Volatile Salt*, doth much help it to dissolve.

5. By its *inciding* and *discussing Quality*, when *externally* applied; which *Qualities* must be attributed to its *Volatile Salt*, it having no other Principle that can cause *those Qualities*, especially in that eminent *degree* as *Opium* has them, and seeing it is not a Thing that has undergone *Fermentation*, as Vinous Spirits, and that it has but one in 32 of the Fixed Salt in its Mass, as the most Excellent Dr. *Crew* proves.

6. By its *resolving Quality*, being *externally* applied; for *Resolution* is caused by such Parts as easily *penetrate* and *mix* with our *Skin*, *Flesh*, *&c.* and such as do so must be of like *active Principles* with our *Parts*; for all know, that easiness of *mixture* is by likeness of Parts, and the *active Principles* of our *Skin*, *Flesh*, *&c.* are *Volatile Salt*, join'd with some *Oily Particles*, (as has been said;) Therefore *Opium* must have such *Principles* to be so great a *Resolver*. Hence it is, That *Gum Ammoniacum*, *Hemlock*, and several *Gums*, *Plants*, *&c.* that are saturated with *Volatile Salts*, are such good *Resolvers*; but it is worth a very particular Remark, That all *Narcotick* Plants are very eminent, yea, the very best *Resolvers* of *hard Tumors*, and the like, as *Solanum lethale*, (or *deadly Night-shade*) *Hemlock*, *Henbane*, *Mandrake*; and the more *Narcotick* they are, the more *Resolving*.

7. By its *exulcerating* or *blistring Quality*, (which is but a stronger sort of *Resolution* of Parts;) which the best and strongest *Opium* that is gathered by Drops out of the Incisions of the Poppies Heads, (as *Authors testifie*) and the best we

we have (as ſome ſay) will do, upon very tender *Skins*, or at leaſt rubify, as *Muſtard*, *&c.* will; which moſt evidently proves its *Volatile Salt*; for all *Bliſterers*, as *Cantharides*, *Piſmire*, *Crowsfoot*, *Spearwort*, *Garlick*, *&c.* do it upon the Account of their *Volatile Salt*, unleſs it be *Lexivials* which have paſſed the Fire, which *Opium* has not.

8. Its offending the Eyes, as Onions, Muſtard, *&c.* do, when it is applied thereto, argues its *Volatile Salt*.

Note, That the very beſt *Opium*, as the *Turks*, *Maſtach*, *&c.* does cauſe this Effect moſt of all, which manifeſtly proves, that the *Vertue* of *Opium* does mainly depend upon *Volatile Salt*, which is moſt certainly the *Cauſe* of that *Effect* of *exulcerating*, (or *bliſtering*) as all do allow in Things that have not paſſed the Fire.

9. Its *Pſilothrick Quality* proves the ſame, for it cauſes the *Hair* to fall by the ſame *Principles*.

10. Its *eminent Titillation* to *Venery*, as *Cantharides*, *Bees*, *Piſmire*, *Sem. Virile*, *Garlick*, *Onions*, *Leeks*, *Horſe Radiſh*, *Muſtard*, *Rochet*, *Baſil*, *Oyſters*, *Bears Garlick*, *Crows Garlick*, *&c.* do moſt infallibly argue the Abundance of its *Volatile Salt*, by which thoſe Things, and all other *Plants* that have much *Volatile Salt*, excite to *Venery*.

11. Its Aptitude to evaporate and flie away, argues its *Volatility*.

12. Its *cauſing a Tickling*, and *Itching* in the *Skin*, does moſt directly prove the ſame; nor does any Thing that is taken inwardly cauſe it more: It muſt have a very *Titillating Volatile Salt*, that will, in ſo ſmall a Quantity as *Opium* is uſually taken, cauſe ſuch *violent Itchings* (as it does) in the Skin, after it has paſſed all *Digeſtions* and *Concoctions*.

13. Its *Bitterneſs* proves the ſame: For the Curious and moſt Perſpicacious Dr. *Grew* ſays, That Bitterneſs proceeds *from Sulphur well impregnated with alcaline or acid Salt ſhackled with Earth*; but it is certain, that it is not an *acid* in *Opium*, for the many *Reaſons* given, and to be added. He alſo ſays, *That when Sulphur and the Alcaline are more equal, they produce a tawny colour*; and *Opium* rudely torn is *tawny*, till the *Air* alters it. All which *Sylvius* confirms, where he ſays, *Pran. Med. L.* II. *Cap.* XXVI. 80. *Omnia amara volatili ſale abundant, ad quod conſtituendum oleum quoque concurrit, ſive Sulphur.* That is, *All bitter Things abound with Volatile Salt, to conſtitute which Oil (or Sulphur) concurs.* I cannot chuſe (tho' I do not much depend upon *Authority* in the general) but value the Aſſertions of ſuch Men, by way of Concurrence at leaſt.

14. The *Acrimonious Sweats* that it cauſes, proves the ſame.

15. It is alſo *Diuretick*, as, and after the ſame manner with *Cantharides*, *Bees*, *Piſmire*, *Millepedes*, *Scurvygraſs*, *Horſe Radiſh*, *&c.* that is, by *Titillation* upon the *Account* of the *Volatile Salt*, which appears by its exciting to *Venery* at the ſame time, as all thoſe *Volatiles* do.

16. Its *cauſing Vomitings* (as it often does) is an undoubted ſign of its *Volatile Salt*; for all *Vegetable Vomits* are ſuch upon that Account, unleſs it be ſuch as may move Vomiting meerly by their being loathed, or nauſeated, which only cauſe ſome particular Perſons to Vomit; but ſuch as are *conſtant Vomitories* are ſo upon the Account of their *Volatile ſalt*, as *Aſærabocea*, *Groundſil*, *Foxgloves*, *Squills*, *&c.* given in a ſufficient Quantity.

17. Its lively *Effects*, as Courage, *&c.* prove the ſame.

18. All

18. All *Authors* that have been Curious, do agree, that *Opium* abounds with *Volatile Salt*, as *Helmont*, *Lemery*, *Le Febure*, *Wedelius*, and indeed every one that ever I read, tho' most of them attribute its Effects to a *Sulphur*, which makes their *Testimony* of its *Volatile Salt* the stronger, as being forced to confess it against their *Hypothesises*.

19. After its *Fermentation* with Leaven in a Sand Heat for 14 days, it affords a *Volatile Salt* in good Quantity, but mixt with *Oil*, which is separated from it by Dissolution in Water, Filtring, *&c.*

20. Its Spirit ferments with Acids, therefore is *Volatile*.

Lastly, (to Pin up all) if you either *Chymically* Analyse it by Fire, or set it to Crystalize, after it is evaporated to a due Condition so to do, it affords a great Quantity of *Volatile Salt*.

Therefore it is past all manner of doubt, (for which *End* I have the longer, and more particularly insisted upon this *Point*) that it is highly impregnated with *Volatile Salt*: But, as I said in the last *Chapter*, it is not enough for it to have *Volatile Salt*, but it must be such as exceeds our own, or other Animals in *Activity*, *Briskness*, *&c.* by Reason of *Quantity* or *Quality*, or both, that it may tickle up, excite, and cause a fine and agreeable *Ovation*, or glowing in our Spirits, which (as was shewn) is very pleasant, (as in the Case of *Sem. Viril.*) especially when agitated by *Warmth*, *Frications*, or such Actuating Causes.

Secondly, It manifestly appears, That the *Volatile Salt* of *Opium* exceeds ours in Activity, Briskness, *&c.*

1. By its *exulcerating* (or bliſtering) *Quality*, eſpecially if it be very good *Opium*.

2. By its *Pſilothrick Quality*, to cauſe the Hair to ſhed.

3. By its *irritating to Venery* in ſo eminent a *Degree*, as *Cantharides*, *Bees*, *Piſmire*, *&c.* do, and even beyond the ordinary Courſe of *Sem. Virile*, which is moſt ſaturated with *Volatile Salt* of any *Part* of the *Animal*, as appears by its Diſſolution (like *Opium*) in *Watery Menſtruums*; its *rank ſmell*, its *titillating* to *Venery*, its *Weight*, *&c.* which is much the ſame with that of *Opium*, both ſinking in *Water*, *&c.*

4. By its *great Irritations to make Water*, like *Cantharides*, *Bees*, *Piſmire*, *Millepedes*, *&c.* when it is taken in a good Quantity, or often.

5. By its cauſing *Vomitings* in a very ſevere manner, which it would not do without a very *poinant Volatile Salt*.

6. By its cauſing ſuch violent *Itchings* in the *Skin* (eſpecially if taken in any Quantity) after it has paſt all *Digeſtions* and *Concoctions*. And,

7. By its *cauſing acrimonious Sweats*, after it has paſt thoſe *Digeſtions* and *Concoctions*.

8. By its *cauſing a very pleaſant Senſation at Stomach*, far above any *Fleſh*, *Jellies*, or any *Animal Nutriment*.

9. By its *offending the Eyes* ſo much by its *Acrimony*, as *Muſtard*, *Onions*, *Horſe Radiſh*, *&c.* do.

10. By its very *pungent* and *acrimonious Taſte* above all Fleſh or Fiſh.

11. By its very rank and vehement Scent, equal to, if not exceeding that of *Semen Virile*.

12. By its *Chymical Analyſis*, whereby it affords a very *acrimonious Volatile Salt* in great plenty, which *Helmont*, *Wedelius*, and others, do confirm.

There-

Therefore it is alſo paſt doubt, That the *Volatile Salt* of *Opium* is more *active*, *acrimonious*, and *titillating*, than thoſe in our *Membranes*, or in *Sem. Virile* it ſelf. But ſeeing it is not *Volatile Salt* alone, (as was ſhewn) which agrees only with one of the *active Principles* of our *Membranes*, (and may be, and is of it ſelf too acrimonious and rude for the *Membranes*, without its being ſweetned up, and ſmooth'd into a more gentle and pleaſing *Agreeableneſs* by Oily Parts) we muſt ſee, whether it is not alſo *Oily*, (or *Sulphureous*) and conſequently a *Sal-Volatile-Oleoſum*, agreeing in both the *active Principles* of our *Membranes*, that it may thereby be the more delectable, gentle, and agreeable.

Thirdly, It is very obvious and evident, That *Opium* is *Sulphureous*.

1. Becauſe the Juice of the *Poppy*, whereof it is made, is of it ſelf, when it drops out of the *Inciſions*, *Milk-white*, which colour in Liquids (eſpecially the Juice of Plants) proceeds from *Sulphureous Particles* mixt with *Water* (or *Phlegm*) as *Milk*, *Emulſions*, *Chyle*, *Cinnamon Water*, and the *Tinctures* of all *Sulphureous* Things dropt into *Water*, do evince.

2. Becauſe it is *inflammable*; for nothing is ſo but what is *Sulphureous*.

3. Becauſe *Opium* will ſoften with a *dry Warmth*, which all, and only, *Sulphureous Things* will do; as all *Roſins*, *Tallows*, *Pitches*, *Turpentines*, *Oils*, and ſuch *Sulphureous Things*.

4. Becauſe it is very *bitter*, and that Oleoſe Particles are always (as Dr. *Grew* and *Sylvius* truely ſay) one Ingredient of a *bitter Taſte*.

5. Its *tawny colour* does alſo (as was ſaid according to Dr. *Grew*) argue much *Sulphur*.

6. Its hot Taſte proves the ſame; for a proper *hot Taſte* is from *Sulphur*, as the *biting* or *pungent* is from *Volatile Salt*.

7. Becauſe of its pungent and ſtrong Smell, which denotes *Sulphur*.

8. Its being ſo diſſolvable as it is in Spirit of Wine, Brandy, and other *Sulphureous Menſtruums*, proves the ſame.

9. Its *diſſolving Quality* argues, that it has the ſame *Principles* with our *Skin* and *Fleſh*, which are *Oleoſe* as well as *Salino-volatile*, and that nothing is a compleat *Diſſolver*, but ſuch as have both; becauſe *Agreeableneſs* in Principles being the *Baſis* of Diſſolution, (as you ſee in *Menſtruums*, and the Things therein diſſolv'd) there is no good, kind, or compleat Diſſolvent of our Fleſh, *&c.* but what participates of both; becauſe otherwiſe there would be a *Diſagreement* in one Reſpect.

10. It appears by *Autopſie* upon the *Chymical Analyſis* of *Opium*, &c. that it has a very conſiderable Quantity of *Sulphur*.

11. So if you only diſſolve it in Water, you'll find much Sulphureous Subſtance undiſſolved at the bottom.

12. All (or moſt) of the *Modern Authors* attribute its Operation to *Sulphur*, agreeing, that it is well impregnated therewith.

Therefore Opium conſiſts very much, as to its *active Principles*, of a *Sal-Volatile-Sulphureum*; but ſtill this does not compleat a moſt agreeable *Sal-Volatile-Oleoſum*; 1. Becauſe it may be a *Sal-Volatile-Reſinoſum*, and yet be a *Sal-Volatile-Sulphureum*. 2. If it be a *Sal-Volatile-Oleoſum*, the Oil and the *Volatile Salt* may be ſo disjoin'd, as not to conſpire and co-operate to pleaſe the *Membranes*, but act ſeparately, as Oil and *Volatile Salt* given out of divers *Spoons*, and cauſe no more

Effect

Effect than *Oil* of *Olives* and *Spirit* of *Sal Ammoniack* taken inwardly, one acting too ſoftly, lazily, and greaſily, to cauſe any brisk and agreeable *Ovation* of the *Spirits*, and the other too rudely ſtinging the Membranes; therefore we muſt proceed in our *Enquiry.*

Fourthly, *Opium* has a ſort of Reſinous *Sulphur*, that is looſe, and not united with the *Volatile Salt*; which plainly appears;

1. Becauſe, if you diſſolve *Opium* in *Water*, cold or hot, or any Watery *Menſtruum*, you'll find a good quantity of *Roſin* undiſſolved at *bottom*, while the *Volatile Salt* is all or moſt diſſolved in the Water, (eſpecially if the Water be often repeated) and quite ſeparated from the *Reſinous Part* which ſubſides, without any more trouble; which ſhews, that the *Volatile Salt* and it are not combined, but in a very looſe and diſtinct manner.

2. Becauſe, if you firſt diſſolve *Opium* in *Spirit* of *Wine*, which imbibes the *Roſin*, it is eaſily again precipitated by plain *Water*, leaving behind it all or moſt of the *Volatile Salt* in the Form of a *red Tincture* in the *Menſtruum*, as it does alſo in the former Caſe.

Note, That the *Reſinous Part* of *Opium* has no Effect as an *Opiate*, for if it be well waſhed with Water (as was ſaid) it has no Operation of that kind, or ſo little, that it is not worth the minding, but all the *Vertue*, *Specifick Taſte*, *Smell*, *&c.* is carried away in that *red Tincture*, which has all the good *Effects* of *Opium*, as Experience aſſures us.

3. Becauſe, if *Opium* be very much torrefied, moſt of the *Volatile Salt* is evaporated, and with it moſt, if not all, the *Vertue* of *Opium*; but the *Roſin* remains as a deadiſh Stuff in Reſpect of the *good Effects* of *Opium*, tho' it is (as ſhall be proved) the Producer of the ill *Effects* thereof. Therefore this Roſin muſt be wholly rejected.

Fifthly, The Red *Tincture* aforeſaid has all, or moſt of the *Volatile Salt* in it.

1. Becauſe *Water* is the Proper Menſtruum for Saline Things, and that the *Tincture* reduced to an *Extract* gives very much in *moiſt Weather*; which Quality it muſt have from the *Volatile Salt*, becauſe it has very little Fixed Salt.

2. Becauſe the Specifick *Bitterneſs* which proceeds from *Volatile ſalt*, and *Oily Parts*, is wholly in that *Red Tincture*.

3. Becauſe that *Tincture* has alſo the Specifick *Rankneſs* of *Smell* that the *Volatile Salt* (as was ſhewn) gives the *Opium*, by the Help of ſome *Oily Parts*.

4. Becauſe that *Tincture*, reduced to an Extract, has the *biting* Taſte of *Opium*, which (as was ſhewn) proceeds from its *Volatile Salt*.

5. Becauſe that *Extract incides, diſcuſſes, reſolves*, is *Philotbrick*, *titillates to Venery*, cauſes *Itchings* in the Skin, *acrimonious Sweats*, *&c.* all which are (as was ſhewn) the Effects of *Volatile Salt*.

But what need I inſiſt ſo much upon its *Effects* to prove it? When,

6. It appears by *Cryſtalization* of the *ſaid Tincture*, after it has been evaporated to a due *degree*, that it contains the *Volatile Salt* in it, which in a cool Place ſhoots to elegant *Cryſtals*; and that,

7. It

7. It is found therein by *Chymical Operation* by *Fire.*

Sixthly, The ſaid *Tincture* is *Oleoſe.*

1. Becauſe the Redneſs of the Tincture muſt be from *Oily Parts*; for pure ſincere *Volatile Salt* gives no ſuch Tincture.

2. Becauſe it is *bitter*, one Ingredient of which *Taſte* is ever Oily Parts (as was ſaid.)

3. Becauſe of its *rank ſmell* like *Sem. Viril.* which proves it to be *Sulphureous*; for the *Volatile Salt* alone has only a quick ſmell, or Urinous at ſartheſt.

4. Becauſe it is of a *Hot Taſte* when reduced to an *Extract*, which *Heat* of *Taſte* conſidered diſtinctly from its pungent, or biting *Taſte*, muſt be from *Sulphureous* or *Oily Parts.*

5. Becauſe *Spirit of Wine*, and other *Spirituo-ſulphureous Menſtruums*, do readily diſſolve it when reduced to an *Extract.*

6. Becauſe the *Extract* ſoftens with dry warmth, as Sulphureous or Oily Things do.

7. Becauſe a true *Sal-Volatile-Oleoſum*, wherein the *Volatile Salt* and *Oily Parts* are intimately combined, (as you find in all *Bloods*, *Tinctures* of ſeveral *Plants* that have ſuch a *Sal-Volatile Oleoſum*) is *red.*

8. Becauſe it could not otherwiſe ſo finely pleaſe the *Membranes*, *cauſe Sleep*, *compoſe the Spirits*, *&c.* if it were all *Volatile Salt*, which is wholly *pungent* and *acrimonious*, mightily *oppoſes Sleep*, and cauſes a great ſtir in the Bloud and Spirits.

But, (as I ſaid as to its *Volatile ſalt*) what need I inſiſt upon its *Effects?* When,

10. Its

10. Its *Inflammability* (after it is reduced to an Extract and dried) puts it out of all Queſtion; And that,

11. An *Oil* may be ſeparated from the *Volatile Salt*, tho' not without Trouble, becauſe that, (as is requiſite to compleat it in the higheſt degree)

Seventhly, The *Oily Parts*, and *Volatile Salt*, are very intimately, and ſtrictly combin'd, as fairly appears,

1. By the *Difficulty* to ſeparate them.

2. By the *Redneſs* of the *Tincture*, (as in *Blood*, *&c.*) for when *Oily* (or Sulphureous) *Particles* are looſe therein, they make *either* a *white Colour*, as the *Roſin* does in the Drops that fall out of the Inciſions in the Heads of the *Poppies*, which are *Milk white*; or leave the *Volatile Spirit* perſpicuous, as in a ſort of artificial *Sal-Volatile-Oleoſum* that is ſold at the *Apothecaries* Shops in *London*.

3. Becauſe it imparts its *Tincture*, which depends upon both, to all *Menſtruums*.

4. Becauſe it imparts its Vertue, which depends upon both, to all *Menſtruums*.

5. Becauſe it imparts its *Specifick Smell*, which depends upon both, to all *Menſtruums*.

6. Becauſe it imparts its Specifick, *hot*, and *biting Taſte*, which depend upon both the *Oily* and *Volatile Particles*, to all *Menſtruums*.

7. Becauſe it will hold its *Vertue* many years, which it could not, if the *Volatile Salt* and *Oily Parts* were not very ſtrictly combined.

8. Becauſe, that notwithſtanding the *Digeſtion* at *Stomach*, it has held its *Specifick Vertue*, *Smell* and *Taſte*, after it has been in it 4, 5, 6, 7, 8, 9, 10, 11, 12, 18, or more *Hours*, as appear'd by its Operating ſo long, and afteward its being Vomited up with the ſame *Taſte* and *Smell* that it had

had at first; than which there cannot be a greater Argument.

9. Because it has been carried off by Stools, which had its *Specifick Smell* after many *Hours* remaining in the *Stomach*.

10. Because its Operation in general lasts long. *Charas* mentions one that it Operated with for about 30 *Hours*; and *Wedelius* another, whom *Opium* caused to Vomit constantly about 18 *Hours* after it was taken.

11. Because it has its *Effects* upon the *Venereal Membranes* after it has passed the *Digestion* at *Stomach*, the Effects of the *Choler*, and *Succus Pancreatus* in the *Duodenum*, been strained through the Coats of the *Intestines* into the *Lacteals*, and through the *Glandules* of the *Mesentery*, mixed and circulated with the *Blood*, *&c.*

12. Because, after all that, it has its *Effect* upon the Skin, by causing an *Itching* therein.

13. Because it not only causes *Acrimonious Sweats*, but such as evidently *smell* thereof, which argues, That the *Specifick Combination* of the *Oily* and *Volatile Parts* baffles all *Coctions*, *Digestions*, *Circulations*, and *Percolations*, that have happened in the *Body*. *Dioscorides* and *Ægineta*, speaking of *Opium*, say, Ὄσμη τοῦ φαρμάκου δι' ὅλου τοῦ σώματος ἐκ διδότας, that is, *The smell of the Medicament is expanded over the whole Body.* Which Things of its Nature do, as *Garlick*, *Onions*, *Semen Animale*, which causes Rankness all over Male Creatures, as *Rams*, *Boars*, *Bulls*, *&c.*

14. *Le Febure*, in his *Chymistry*, *Part* 2. *p.* 33. says, That *Opium has a Volatile Salt inseperably mixt with Sulphur* (or Oily Parts.)

15. *Wedelius*, in his *Opiologia*, *Lib.* 2. *Sect.* 1. *Cap.* 4. *P.* 91. speaking of *Opium*, says, *Sal ejus cum sulphure intime combinatum sudores efficit*, that is, *Its salt being intimately combined with sulphur*, (or Oil)

Oil) *cauſes Sweat.* And, *Lib.* 2. *P.* 143. Κρᾶσιν *obtinuit non facile diſſipabilem*, that is, *It has a contexture not eaſily diſſipable.*

18. All know how apt *Volatile Salt* and *Oily Parts* are to combine; Therefore

Opium acts and produces its uſual good Effects by a *Sal-Volatile-Oleoſum*, ſomewhat more active than that in our Membranes, whoſe Principles are moſt intimately and ſtrictly combined, and ſo that it is qualified in the higheſt degree for our Purpoſe; Becauſe,

1. It agrees in *Principles* with our Membranes.

2. That its *Sal-Volatile-Oleoſum* is more active and vigorous than that of the *Membranes*, to actuate and excite the *Spiritus inſiti*, and finely to tickle and gratifie the *Membranes.*

3. That the *Volatile Salt* and *Oily Parts* being ſo intimately combined, do deliciouſly qualifie one the other for that Purpoſe; While the Oily ſmooths and lenifies the *Volatile Salt*, and the *Volatile Salt* actuates and quickens the Oily; And that being ſo combined,

4. Both conſpire to a permanent and exalted *Pleaſure* of the *Membranes*, eſpecially at *Stomach*, and the *Venereal Parts*, where they are ſo exquiſitely diſpoſed for *Senſation.*

Therefore the *Sal-Volatile-Oleoſum* of *Opium*, ſeparated from its *Roſin*, is moſt conſummate, and beſt qualified, that poſſibly can be imagined, to *pleaſe*, *gratifie*, and *finely* to *titillate* our *Membranes*, or *Organs* of *Senſation*; which was the Thing required.

I can.

I cannot better illuſtrate its Nature, than by the moſt exalted Thing in an Animal, *viz.* its *Semen*: Therefore for Confirmation of its *Principles*, and *Excellency* therein, I will conſider its *Likeneſs* and *Agreement* therewith;

1. In being both a *Sal Volatile-Oleoſum.*

2. In having a more active, vigorous, and exalted *Sal Volatile-Oleoſum*, than any Part of the *Animal.*

3. In having the *Volatile Salt* and *Oleous Particles* intimately combined, for *Semen Animale* will (as *Opium*) keep very long uncorrupted, as appears by its long ſtay in the *Veſiculæ ſeminales* of ſome *Animals*, that do not excern it in many years.

4. In that both are apt to mix with all ſorts of *Menſtruums*, and both *Mole minima, Virtute maxima.*

5. In having much the ſame Smell, *viz.* a rank and vehement one.

6. In tainting the Body therewith (as has been ſhewn.)

7. In being much of the ſame *Weight*, as appears by both ſinking in *Water*, *&c.*

8. The *Taſte* muſt (in all Probability) have a Rankneſs in it like that of *Opium*, becauſe it gives a *rank Taſte* to the whole Body of *Male Creatures.*

9. Both excite *Venery*, cauſe Erections, *Venereal Fury*, and *Nocturnal Pollutions*, *&c.*

10. Both cauſe *Boldneſs*, *Courage*, and *Magnanimity*, which are reckon'd among the *Effects* of *Opium*, and are the *common Effects* of *Plenitude* of Seed in *Animals* (that are otherwiſe *puſillanimous*) in *Times* of *Copulation*; ſo Modeſt and Sheepiſh *Boys* grow much more *aſſured*, *bold*, and (as they commonly call it) *Manlike*, upon *Puberty*; and *Girls* grow more Womanlike in their *Diſpoſitions*; and

and 'tis my *Observation*, That the *Men* who breed most of the *Sem. Virile*, are generally, if not always, the most *Valiant*.

11. Both do cause a great *Relaxation* upon the *Pleasure* thereof, as appears after a good *Dose* of *Opium*, and upon *Emission* of the other; by the *Deadness of the Eyes*, (or *Laxity* of the *Cornea*) in both Cases, *Dilatation of the Pupill*, *Floridity of the Skin*, *large Perspiration*, *laxity of the Limbs*, *Sleepiness*, *loss of Memory and Sense*, *alienation of the Mind*, *a wide Pulse*, *Indolence*, *loss of Feeling* in both Cases, and other Signs of *Relaxation*.

12. Both *Opium* and *Puberty* cause a growth of the *Penis*, *Breasts*, and *increase Milk*, by Reason of the *Relaxation* that they cause, which (as in *Sleep*,) causes the greater *Nutrition*; but of the manner how it happens upon *Relaxation*, more hereafter, if there be occasion. Hence it is,

13. That both *Opium* and *Puberty* are apt to bring down the *Menses*, and open the *Viæ*, by the *Relaxation*; and that *Marriage* (or the Pleasure of *Venereal Acts*) do by the like *Relaxation* promote the *Menses*; That both *Opium* and such Acts are apt to cause Miscarriages by relaxing the Neck of the Womb, *&c.*

14. Both cause *Sadness* and *Dejection* when the Operation is over, as indeed *Pleasure* generally does, especially if intense.

15. Both *Opium* and *Sem. Animale* prevent *Lassitude*, and cause *Euphory*, or easier Undergoing of *Labour*; Hence it is, that *Stone Horses* will not be so soon tired when full thereof, and quickly recover if tired; which might doubtless be observed in other *Animals*, but that they are not used to Labour, and so not obvious to be observed.

16. *Au-*

16. *Authors* do say, That *Sem. Virile* takes of *Venereal Impotence*, procures *Love*, *&c.* which doubtless must be by exciting to *Venery*, as *Opium* does. Thus the *Genitals* of *Bucks*, *Boars*, *Bucks* of *Hares*, *Cocks*, *&c.* do (as *Opium*) excite *Venery*; and the Seed of *Animals*, as of a Camel, and the aforesaid Creatures, come to be esteemed *Hypnoticks*; and (doubtless) all *Animal Seed*, especially of the more Salaceous *Creatures*, is an *Opiate* in some *degree*.

To be short, The main (if not all) the *Difference* in their *Effects* arises only,

1. From the *Different Parts* that they affect; because *Opium* affects the *Stomach*, the *Venereal*, and all the *Membranes* in *general*; and *Sem. Animale* only the *Venereal Parts* immediately, tho' an intense *Pleasure* of one Part does affect the whole.

2. That *Opium* does affect with a Sense of Pleasure more permanent, *viz.* for many *Hours*, (as has been said) and that the *Pleasure* of the other is *Momentary*.

Therefore Opium *acts by causing an intense, permanent, and charming Pleasure of the Membranes in general, but more particularly of the* Stomach *and* Venereal Parts, *as being more exquisitely disposed for Sensation for the Preservation of the* Individuum *and* Species.

It cannot be much wondred at, considering our *Active Principles* are a *Sal-Volatile-Oleosum*, and that *Opium* is such, and that we naturally carry an *Opiate* within us, that in some Cases our ordinary *Sal-Volatile-Oleosum*, or that of the *Choler*, *Semen*, *&c.* being by some accident exalted

alted towards the Nature of *Opium*, may have the Effect of an *Opiate* upon us, by cauſing *Sopors*, and *Lethargick Diſtempers*, *Fluor uterinus* by *Titillation*, *&c.*

Thus the Spume of ſome *Male Animals*, *Mummy*, *&c.* are reputed Opiates. *Borellus* ſpeaks of a *Soporiferous Aura*, that proceeded from ones *Thumb*, cured by a *Cauſtick*. I have read of a *Cataphora* from *Worms*, a *Soporiferous Fume* from the *Womb*, and very many ſuch ſorts of Inſtances, which Things are now eaſily conceived; for 'tis but ſuppoſing a Fume of the Nature of *Sem. Animale*, or its *Aura*, (for I can no longer doubt but it is an *Opiate*) and it would have much the ſame *Effects* with *Opium*, if it were fit to uſe it after the ſame manner.

Having ſhewn, 1. *Which are the predominant active Principles in* Opium, *and how combined*, &c. 2. *Which of them produces the uſual and laudable Effects of* Opium; *And why in general*; I come now to the Third Particular, *viz.* to ſhew,

III. *Which of them produces its ill Effects*; *And why.*

Its *ill Effects* are theſe, *viz. Nauſeas*, *Vomitings*, which are generally very diſmal, with great diſtreſs, and ſometimes dangerous; *Swimming* in the *Head*, *Hiccoughs*, *Diſtreſſes*, *Anxieties*, *Convulſions*, *Faintings*, *Leipothymies*, *Syncopes*, &c.

1. *Note*, That its *grievous Effects* are at, or about the *Region* of the *Stomach*, or particularly the Mouth (or Pit) thereof, or thence ariſing by *Conſent.*

2. *Note*,

2. *Note*, That (seeing there is nothing so good, but may cause evil *Effects* in an excessive Quantity) this *Enquiry* is more properly, What *Principle*, or *Principles* of *Opium*, do cause those ill *Effects* in an *ordinary Dose*? for what will in a *moderate Dose*, will (be sure) cause them in an *excessive Dose*.

3. *Note*, That all the *constant Effects* of *Opium* (as you may observe in the *Enumeration* thereof in the *Fourth Chapter*) are *good and laudable Effects*; it follows therefore, that the *bad* are *accidental*.

1. It is not the *Earthy* or *Phlegmatick Part* of *Opium* that causes those *ill Effects*, because they are *Passive Principles*, and consequently have not such a *Power*, besides that they are known to be *innocent*.

2. *Opium* has all those *ill Effects*, when both the *Earthy* and *Phlegmatick Parts* are separated from it, as when an Extract of well *torrefied Opium* is made in *Spirit of Wine*, for by that means the *Phlegmatick Part* is dried up, and the *Earthy Parts* subside, and are separated; yea, such *Extracts* made by *Spirit of Wine*, do cause those *evil Effects* rather more than *crude Opium* with its *Earth* and *Phlegm* in it, as *Experience* assures us, and *Reason* will plainly confirm by and by, however fond the World is of such *Preparations*.

3. It is evident from the *Premises*, that the *Sal-Volatile-Oleosum* of *Opium* cannot cause those *Vomitings*, *Hiccoughs*, &c. for they are the *Effects* of *grievous Sensation* at *Stomach*; but the *Sal-Volatile-Oleosum* causes a most agreeable and *pleasing Sensation* at *Stomach*.

4. Nothing quiets *Vomitings*, *Convulsions*, *Hiccoughs*, &c. more than that *Sal-Volatile-Oleosum* of *Opium*.

5. *Experience* informs us, That the *Sal-Volatile-Oleosum* of *Opium*, separated from all other *Parts* and *Principles* thereof, never causes such *evil Effects*, as I, and *another Physician* in *London*, can testifie; as does also *Le Mort*, in the most Learned Dr. *Love*'s *Collectanea*, where he says of such a *Preparation* thereof, as contains only the *Sal-Volatile-Oleosum*, That *Nunquam Anxietates circa Præcordia, aut Phantasias conciliat*; That is, *It never causes Anxieties about the Mouth of the Stomach*, &c. for that is most properly to be understood by (*Præcordia*;) *Wedelius* testifies the like of such another *Preparation*, and so do several *Authors*, tho' they did not (in the least) know why, but only by *Experience*.

6. Its *Fixt Salt* is *innocent* in its *Nature*, and but the 32d Part of *Opium*, which is too inconsiderable in an ordinary moderate Dose to cause any *sensible Effect*.

It follows *therefore*, That it must be the *Resinous Part* of *Opium*, which it has in a considerable Quantity, that must cause those ill *Effects*. This manifestly appears;

1. Because a *Tincture* of *Opium* in *Water*, which takes up none of the *Rosin*, but lets it fall into the Bottom, never causes any such *ill Effects*; which it does not also, if reduced to an *Extract* by *Evaporation*, yet have they all the usual *good Effects* of *Opium*.

2. *Wedelius* in his *Opiolog.* assures the same of the like *Preparation* in *Phlegm* of distilled *Vinegar*. *L.* 2. *Sect.* 1. *C.* 5. *P.* 92.

3. An

3. An *Extract* of *Opium* in *Spirit of Wine* does often cause those *ill Effects*, and no other *Preparation* causes them as often. "*Wedelius ibid. A Laudano opiato cum Spiritu Vini correcto solum ferè observavimus ortos Vomitus; a nostro vero, quod cum Phlegmate Aceti distillati fieri diximus, nunquam Vomitum, vel Nauseam saltem, contigisse meminimus.* That is, *We have observed Vomitings almost only from* Laudanum *prepared with* Spirit of Wine, *but never any Vomiting or Nausea from that prepared in Phlegm of distill'd Vinegar.* Which he confirms, *L.* 1. *sect.* 2. *c.* 4. *p.* 62. saying (in *Latine*) "*That a curious Observation is to be noted, by which it appears, that an Extract of* Opium, *with* Spirit of Wine, *shews more Narcotick Force*, by which he means, *That it causes more ill Effects than prepared in distilled Vinegar*; Whereas that in *Spirit of Wine* has nothing more in it than that in *Vinegar*, besides the *Resinous Parts*: Therefore these do cause all the *Mischief*.

Note also, That an *Extract* in *Spirit of Wine* has in it (*Quantity* for *Quantity*) more of the *Resinous Parts* than *Crude Opium*, both because the Earthy Parts, that help'd to make up the Bulk, are taken away in that Preparation, and because the *Spirit of Wine* imbibes the *Rosin* more greedily than other *Principles* of the *Opium*; so that every *Dose* must in *Proportion* have much more *Rosin* in it than *Crude Opium*. Therefore it is no wonder that it causes those *ill Effects* more frequently, since the *Rosin* is most certainly the Cause thereof, as has been, and shall be more fully, and beyond all contradiction, proved.

Yet is this the *Preparation* boasted of by the blind and inadvertent World; it would amaze, nay terrifie a Man to see what great Care is taken

to be ſure to render *Opium* miſchievous, by ſolicitouſly uſing *Spirit of Wine* in extracting *Laudanums*; and then, and not till then, they boaſt of the *Preparation*, as *Charas* and very many others do, calling it, not without great Oſtentation, (and deſperate *Folly*) their *Laudanum:* May it be *theirs*, and none others; a *Turk* would be a Madman to uſe it for *Crude Opium*, becauſe it has much more of the pernicious Principle in it; It is the common, and much eſteemed way, *firſt* to extract it out of *Water*, (and then it is very good, laudable and innocent) but thought nothing worth till they *extract* the *Roſin* (that is all left behind by the *Water*) in *Spirit of Wine*, and add it to the other; then do they with great *Authority* praiſe it, that is, when they have wiſely added the *Poiſon* to the *Panacea*; It is as if they added *Ratsbane* to a *Cordial*, and not think the Cordial worthy Commendation till they have done ſo.

4. It appears, That the *Roſin* is the Cauſe of thoſe *Ill Effects*, in that they happen at *Stomach*, or from it by conſent, ſince *Opium* has nothing in it that can offend the *Stomach* but the *Roſin*; of which it was ſhewn in *Chap.* 14. how very offenſive it is to the *Stomach* by its *Indigeſtibleneſs* and *ſticking* to it, but even intolerable if alſo arm'd with *pungent Particles*, ſuch as *Volatile Salts* have, with which *Opium* abounds.

5. It has been never obſerved, that any *Preparation* of *Opium*, that was ſeparated from the *Reſinous Parts*, did ever cauſe any ſuch *ill Effects*. But,

6. It has been often obſerved, That if *Crude Opium*, or a *Reſinous Preparation* thereof, was given alone in the *Form* of *Pills*, or any *ſolid Form*, that it was very apt to cauſe thoſe *Effects: Wede-*

[illegible]s, That he never obſerved thoſe *Miſchiefs* but

but after *Preparations* thereof in the *Form* of *Pills*; and it follows from what he has ſaid before, that it was either *Crude Opium*, or that *horrid Extract* out of *Spirit of Wine*, both which are *Reſinous*.

Note, That ſince the very Form that it is given in doth ſo much alter the Caſe, it follows, that it is not poiſonous in it ſelf as ſuch.

7. It is obſerved, That *Crude Opium*, *Extracts* in *Spirit of Wine*, and ſuch *Reſinous Preparations*, ſtay very long at *Stomach*, *viz.* 4, 5, 6, 7, 8, 9, 10, 11, 12, nay, ſometimes 18 or 20 Hours, as *Charas* himſelf intimates in reference to a *Gentleman* that took *half a Drachm* of his *Extract* 2 or 3 times a Week, That he *Vomited* if he took a *Clyſter* before 20 Hours were expired after the taking of it; That certainly argues, that it, or a great part thereof, was ſtill at *Stomach*, which *ſtay* is a moſt grievous Thing to the *Stomach* when it is beyond the uſual time that Things are digeſted in it. *Now* ſuch a *ſtay* can be attributed to nothing but the *Roſin* ſticking to the *Coat* of the *Stomach*, for that *Preparation* of *Charas* had nothing in it but what was diſſolved in *Water*, (which is therefore always diſſolvable at *Stomach*) and the *Roſin* extracted out of the *Spirit of Wine*; therefore it was *indiſſolvable* and *viſcid Roſin* that cauſed ſo long a *ſtay*, tho' that *Gentleman* did, by ſtrength of *Digeſtion*, conquer it at laſt, and that without *Vomiting*, unleſs he (as was ſaid) took a *Clyſter* within the 20 *Hours*: Its long ſtay at *Stomach* is manifeſt alſo, in that after 20 *Hours* it purged him, and not before; which *Purging* (as ſhall be ſhewn hereafter, and has been in ſome meaſure hinted) happens by the *Diſſolution* of the *Roſin* by a ſtrong *Digeſtion*; and therefore it happens only when *Reſinous Preparations* are given

in good Quantity to Men that have such a *Digestion*, or a *Canine Appetite*, as an Experienced *Person* in the Matter of *Opium* informed me, and I since observed to be very true.

8. It must be somewhat in *Opium* that is indigestible and sticking to the Stomach, or else it could not cause Vomiting so long as it does, that is, 12, 14, 16, or more Hours, whereas other Vomits do generally operate but for 2 or 3 Hours at farthest, and *Opium* has nothing in it indigestible and sticking but its *Rosin*.

9. It is to be *noted*, That when *Opium* is prepared, join'd, or given, with such Things as destroy or prevent the *sticking* of its *Rosin* to the *Stomach*, and help its *Dissolution*, *Digestion*, or slipping out of the *Stomach*, it causes no such ill *Effects*, tho' *Crude Opium*, or a *Resinous Preparation*, be given. Thus if you prepare it by *Lixivials*, which alter the nature of the *Rosin* by (as it were) *Soapifying* it, and thereby take away its *sticking Quality*, and rendring it (as Soap is) dissolvable, slippery, and passable at *Stomach*, it causes no such *Disturbances*. Hence it is that *Lixivials* are found to be such true *Correctors* of *Opium*, (tho' the *Reason* has not been considered, as will appear hereafter) and that the *Sapo Tartare* makes *Matthew*'s (or *Starkey*'s) *Pill*, and the *Pilulæ pacifica*, so safe, and free from *ill Effects*; as also *Salt* of *Tartar* does *Libavius*'s and *Langelott*'s famous *Preparations*: Of which expect more when I come to speak of the *Preparation* of *Opium* in *Chap.* 26. So,

10. If you subdue *Opium*, as you do *Rosins* and *Turpentines*, with the *Yolk* of an Egg, before you give it, it becomes safe, because you, by that means, dissolve its *Rosin*, and prevent its adhering to the *Coat* of the *Stomach*, and render it *digestible* and *passable*, which is a most certain *sign* that its *Rosin* causes those ill *Effects*.

11. It

11. It is for the same *Reason*, that *Opium* finely powdered, and mixed with other *Things* that keep its *Resinous Parts* from a *Coalescence*, as in *Venice Treacle*, *&c.* that it is not so apt to cause those *evil Effects*; This (I doubt not) made the Ancients, who had no better *Way*, give it in *Electuaries* finely divided among other Things, which they did so frequently, that all *Electuaries* came to be call'd *Opiates*; This (upon Experience I suppose) made *Galen* say, That *Opium* was not safe alone, but mix'd with other Things it became a good *Medicament*.

12. *Wedelius* says, That it seldom causes *ill Effects* when given in a fine Powder with other Things; yet is it the same in Substance, and to all Intents, but that the *Resinous Parts* being segregated and scattered, become more subduable, and less liable to *Coalescence*; whereas if it be given alone in the Form of a *Pill*, all the *Rosin* falls together upon one Part of the *Stomach*, and there sticks. Therefore *Crude* or *Resinous Opium* should never be given alone in the Form of a *Pill*.

13. The Blundering *Ancients* giving Wine to correct (as they thought) the *cold Quality* of *Opium*, found by *Experience*, that *old generous Wine* taken pretty freely after *Opium*, did very much prevent those *ill Effects*; but it could not be by correcting the *cold Quality* of *Opium*, which it has not, nor indeed for any imaginable *Reason*, but that being a *Sulphureous Menstruum* it helped the *Dissolution* and *Digestion* of the *Rosin*, and the more for being *old* (as all know) because more spirituous, defecated, and vigorous; whereas had it not been for that *Reason*, Wine must have rather increased its Effects than otherwise, as being an *Opiate*.

14. It is for the ſame Reaſon, that a *Tincture* of *Opium* in *Spirit of Wine* is found to be much ſafer than the *Extract* made out of it, tho' the Subſtance is the ſame, becauſe that in the *Tincture* the *Particles* of the *Roſin* are finely divided and ſcattered, and ſo ſubduable, and not like to *ſtick* to the *Coat* of the *Stomach*.

15. *Opium in Clyſters* has kill'd People by ſticking to the *Inteſtinum rectum*, whereas it has nothing in it, as is apparent from the *Premiſes*, that can hurt, by ſticking to them, but its Reſinous Parts; much more then may it grieve the more exquiſitely ſenſile *Stomach* by the ſame means.

From what is ſaid it will be obvious how duely to prepare and correct *Opium*, tho' there has been no true Conception thereof hitherto, but meer groundleſs and phantaſtick Imaginations.

Objection. Some may ſay (for the Folly of the World is great) Why ſhould not an Extract out of Spirit of Wine be good? For ſince Wine corrects it, much more ſhould Spirit of Wine do it by its more active *Sulphureous Spirit*?

Anſwer. So it will, if you pour it upon it in the *Stomach*, or a Digeſting Pot, for then it will much contribute to its *Diviſion*, *Digeſtion*, and taking off its *Viſcidity*, as *Spirit of Wine* does in any *Veſſel* wherein you pour it upon *Roſin*; but it is quite another *Matter* when reduced and reunited into the *Form* of an *Extract* again, and all the *Spirit of Wine* evaporated (or otherwiſe ſeparated) from it, for then the *Reſinous Parts* are in *Statu quo* of *Coaleſcence*, and want to be ſeparated by *Wine* or *Spirit of Wine*, *Lixivials*, *Yolk of an Egg*, *&c.* as much as ever.

Obj.

Obj. It may be ſaid, That the *Roſin* of *Opium* is but as other *Roſins*, therefore why ſhould it offend ſo much in the Caſe of *Opium*.

Anſ. For Three very manifeſt Reaſons; 1. That it is a *Roſin* of a peculiar *Clammineſs* and *Viſcidity*. 2. That it has Acrimony in't, as appears by its Purging Quality if it be given in any Quantity, and that the *Stomach* diſſolves it (as was ſhewn.) 3. That it is join'd with the pungent Particles of the *Volatile Salt* of the *Opium*, which, when it ſticks to the *Stomach*, it holds to it, tearing it too long and continually with thoſe *Points* upon the ſame *Part*, which muſt cauſe *Diſtreſs* and *Vomitings* in Weak *Stomachs* that cannot digeſt it, and that ſometimes to no *Purpoſe*, whereupon follows *Convulſions*, *Hiccoughs*, *&c.* and all *Endeavours failing*, an *Yielding* or *Succumbency*, followed by *Faintings*, *Syncopes*, *Leipothymies*, &c. and ſometimes *Death* it ſelf, for it muſt be a moſt grievous Thing to be ſo continually ſtung in the ſame Part of the moſt *ſenſile Membrane* of the *Stomach* without Remedy or Redreſs. If ſome have died of a little *Gum Ammoniacum*, or *Sagapenum*, ſticking to the *Inteſtinum Rectum* or *Colon*, which are the Sink of the *Body*, and fitted for and uſed to bear all *Faces* and *Traſh*, much more muſt the *nice* and exquiſitely diſpoſed *Membrane* at *Stomach* be grieved by ſuch *pointed Roſin*, as that of *Opium*, ſticking to ſome Part thereof; beſides, that the *Stomach* does peculiarly hate and loath, that any Thing, how gentle ſoever, ſhould ſtay too long in it, which creates frequent and ſad *Diſturbances* in ſuch whoſe *Stomachs* are relaxed, (as 'tis alſo in the Caſe of *Opium*) and cannot in due *time* diſcharge themſelves of the grieving Matter: *Therefore* ſuch as are moſtly troubled with thoſe *diſmal Symptoms* after *Reſinous Opium*,

Opium, are People that have fine *Textures*, and ill *Digestions*, with whom it must, and does deal for a good while, as a *Pleaser* of the *Stomach*, till the *indigestible Rosin* that is stuck to it, does therefore, and because it holds the *Points* of the *Volatile Salt* so tediously and importunately to one Part, grievously teaz and urge the *Stomach* to *Vomit*, &c. which it does in some sooner, in others later, according to their *respective Disposition* of *Stomach*. Hence it is that it operates pleasingly in some for *several Hours* before it excites a *Nausea*, &c. *viz.* 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, and more *Hours*, and in such as have a *sturdy Texture*, and *strong Digestion*, operates only pleasingly all the *time*, because their *Sensation* is not so nice, and that they gradually digest the *Rosin*, which, if the *Opium* was given in a *large Dose*, does (as *Rosins* dissolved are apt to do, especially if they have any *Acrimony* as this has) turn into a *Purger*, which brings down *Ordure* that smells of the *Opium*, and so the Danger is over: How common is it, that *Vomitories*, being much subdued in some *Stomach*, turn to be *Purgers*?

Thus it happens with *Dogs*, that have a *robust Texture*, and *strong Digestion*; but such *Resinous Opium* deals severely with *Cats*, and commonly kills them. You may see from the *Premises*, *why* it causes ill *Symptoms* oftner in *Women*, and *Children*, than in *Men*, and in *fine textur'd* Men, than the *robust*, and in such as have weak *Digestions*, rather than in them that have *strong*; *why* it causes all the *Symptoms* of *pleasing Sensation* at first, and the *ill Effects* afterward; *why* some have no *ill Effect* after it, even in a large Quantity, unless you'll call *Purging* an *ill Effect*; *why* such as Purge after a great *Dose* escape the Danger,

ger, as *Dogs*, *&c.* *why* their *Vomits*, especially the first, smell, *&c.* of the *Opium*, tho' the *Vomiting* happens after many *Hours*; *why* the *Vomitings* are so very *tedious* and *severe*, *viz.* because of the stubborn Adherence of the *Rosin* to the *Stomach*; *why* it operates so long a *time* in some, in comparison of others, *viz.* by staying so long at *Stomach*.

1. All which seem to me a good Argument, That such as dye with *Opium*, dye while it is at *Stomach*, and consequently, because of the *Rosin* which must needs be fatal in great *Doses*, seeing it is sometimes so very grievous in *Doses* of a *Grain* or Two, that bring *People* even to *Death's Door* with *Vomitings*, *Distresses*, *Syncopes*, *&c.* yea, and has kill'd some, even in that small Quantity, as I am inform'd.

2. Some evidently dye while it is at *Stomach*, because they dye soon after they Vomited up somewhat that smelled of it, tho' possibly the *Rosin* still stuck to it.

3. Because others evidently dye of the *Vomiting* and its plain *Effects* at *Stomach*.

4. Because they commonly dye with a *Hiccough*.

5. Men dye of it within the usual time that it stays at *Stomach*, which is sometimes 20 *Hours* for certain; whatever more it may be when large *Doses* are taken; and to me it seems an *Argument* of its killing at *Stomach*, when they dye after 20 *Hours*, because if it did not stick at *Stomach* all that time, the *Operation* must have been over, or, at least, much declined, and consequently the Height of the *Danger* past.

6. I cannot find that any have died of *Opium* when the *Rosin* was separated from it, tho' I do not deny but that it may kill then, as an immoderate

derate Quantity of Wine has done. But this I can tell, that one did, at Mr. *Banks's* the *Chymist* in *Wulbrook* in the *City* of *London*, drink (as Mr. *Banks* inform'd me) a *Pint* and a *Half* of such a Liquid Preparation of *Opium*, that had the *Rosin* separated from it, that had the Power of 3 Ounces of *Opium* in it, and it never harmed nor discomposed him, but that he Vomited about an Hour after it was taken; whether he did so by Reason of the *Opium*, or because the Person was Crop-sick, (as they call it) by Reason he had drank much Wine before, or both, I cannot determine.

Now (I hope) that my inquisitive Reader is fully satisfied,

1. That *Opium* does not act by a *Cold Quality*, nor by the Means of *Fumes*, nor any how by *diminishing or disabling the Spirits*, (except it be that the *pernicious Rosin* may do something of that *kind* by its aforesaid ill Effects) but by pleasantly affecting the *Membranes* at *Stomach*, *Venereal Parts*, *&c.*

2. That *Sleep* is caused by *Relaxation*, and *quieting* the *Spirits*.

3. That *Pleasure*, especially if *intense* and lasting, as that by *Opium*, *comforts*, *enlivens*, *encourages*, and *causes an Ovation* of the *sensitive Soul* and *Spirits*; and *Displeasure* causes *Sadness*, *Dejection*, *&c.*

4. How *Pleasure* must cause *Complacency*, *Satisfaction*, *Content*, *Acquiescence*, and *Composure* of the *sensitive Soul* and *Spirits*, as *Grievances* cause the contrary.

5. How *Pleasure*, elevating and keeping up the *Spirits*, and causing an entire *Relaxation* of the *Defensive*, and a great *Relaxation* of the *Vigilative* Con-

Contraction, which tire the *ſenſitive Soul*, muſt cauſe *Euphory*, or eaſie undergoing of *Labour*, *Journeys*, *&c.* without *Laſſitude*, as *Experience* ſhews.

6. How *Pleaſure* cauſes *Relaxation* of all the *ſenſile Parts.*

7. How the ſaid *Relaxation* (as in *Sleep*) does, by ſuffering the *Animal Spirits* to expand, and thereby making them unfit to carry *Impreſſions* ſmartly, which is neceſſary to convey a ſenſe of *Pain*, (for a *ſmart Impreſſion* is the very cauſe of it) take away *Pain*: To which you may add, That the *ſenſitive Soul's* attending willingly to the Senſe of *Pleaſure*, is diverted from *Pain*, and that a Senſe of *Pain* cannot be in the ſame Subject with *Pleaſure*, which being therefore once excited, *Pain* muſt diſappear; but that of taking away all *ſmartneſs* of *Impreſſion* by *Relaxation*, is a plain *Mechanical Cauſe.*

8. How therefore all *Fluxes* that are cauſed by, or require a *grievous Senſation*, or *Irritation* by *Quantity* or *Quality*, to maintain and continue them, by cauſing a *Contraction* of the Parts to ſqueeſe out the *Humours*, muſt be moderated for want of *Senſation* (upon ſuch *Relaxation*) to irritate the Parts, as it happens in *Sleep*, or in any Caſe where *Relaxation*, and thereby *Expanſion* of the *Animal Spirits*, incapacitates them to carry *Impreſſions* ſmartly, which is of the *Eſſence* of *Pain*, (as has been ſhewn.)

9. How *Perſpiration* muſt be promoted by *Relaxation*, which opens the *Pores.*

10. How, that by the ſame Means, *Sweat* alſo muſt be promoted, if the Body be full of moiſture.

11. How *Opium* (or *Semen Animale*) being of the ſame *Principles*, and of like Principles with *Cantharides*, *Piſmire*, *Bees*, *Garlick*, *&c.* muſt excite to *Venery*, cauſe *Itchings* of the *Skin*, *&c.*

12. How

12. How *Opium* may, by too high an *Ovation* of the *Spirits*, cause *Watching*, while *Pleasure* causing *Relaxation*, *&c.* may take away *Pain*; for *Relaxation*, as in *Sleep*, *Syncopes*, *&c.* is enough to take away *Pain*; but to Sleep, *Quietness* of the *Spirits* is also required, as well as their *Expansion* by *Relaxation*; so that *Pain* may very well be taken off without *Sleep*, as it often is by *Opium* that always relaxes.

13. How the *Pleasure* that *Opium* causes, is (as was said) by the same *Principles*, and therefore of the same Nature with that which *Animal Seed* causes upon the *Membranes*, but that *Animal Seed* causes it only upon one Part, and *Opium* upon the *Membranes* of the *Stomach*, *Venereal Parts*, and all other in *general*, and that only for a *Moment*, but *this* of *Opium* for many *Hours*, by which Means the *Effects* of *Relaxtion* by *Pleasure* come to be more remarkable; as after much *Wine*, whose Effects is somewhat lasting and *internal*, as that of *Opium* is.

14. How the *Rosin* of *Opium* causes its *ill Effects* by its *Indigestibleness*, *adhering Quality*, and *tedious stinging* of the exquisitely nice Coat of the *Stomach*, by continually teazing and urging it by its *Acrimony* and *acute Volatile Points* or *Spicula*.

Therefore having, 1. *A most perfect and compleat Sol-Volatile-Oleosum* in *Opium*, of the same pleasing *Principles* as to all *Membranes*, (as *Animal Seed* is to the Membranes of *Venus*) whereby they must be *pleased*, *tickled*, and *relaxed*; 2. *A pernicious Rosin* indigestible, sticking, and arm'd with *acrimonious* and *stinging Points*, which must highly offend the most *sensile Coat* at the *Stomach*; I am now ready (by *God's Assistance*) to explain every *Phenomenon*, or *Effect* of *Opium*, however *Amazing* and *Mysterious*, hoping they will not remain long so.

CHAP.

CHAP. XVI.

The Explication of the Effects of Opium *used Externally.*

ITS Effects Externally used are of Two sorts, *either,*

I. As an *Opiate*, or *pleasing Tickler of the Membranes*; Or,

II. As an *Alterative* of the Parts that it is applied to.

First, As an *Opiate* or *Pleaser of the Membranes*, it has the same *Effects* as *Opium* used internally, and for the same Reason; therefore the Cause of its Operation, in this Case, will be better seen by the Explication of its *Internal Effects*, which are far more perfect, compleat, and certain.

Secondly, As an *Alterative* of the Parts that it is applied to, which are the following, *viz.*

1. It *incides*, *resolves*, and *discusses* by its pointed, penetrating, and *volatile Salt*, insinuating it self into the *Parts* and *Humours* of the *Animal*, because its Particles are fine, minute, and agreeable thereto, (as *Menstruums* to the Things to be dissolved:) Then by its *Volatility* it *discusses* what it has so *incided* and *resolved*.

2. It *mollefies and relaxes* by its *Sal-Volatile-Oleosum* so resolving the *Parts* and *Humours*, and thereby kindly loosening them; Thus *Opiates*, as

Sola-

Solanum Lethale, (or deadly Night Shade) *Hemlock*, *Mandrake*, *&c.* come to be of excellent Uſe in hard *Tumours* of the *Spleen*, *Tophouſneſs*, *&c.*

3. It *Maturates and Suppurates* for the aforeſaid Reaſons, for nothing can better diſpoſe towards Maturation and Suppuration than *relaxing*, *mollefying*, and *reſolving*.

4. It *exulcerates* or cauſes *Bliſters*, or at leaſt *rubifies* tender Skins, if it be very ſtrong, becauſe of its *Volatile Salt*, as *Cantharides*, *Spearwort*, and other Things do upon the ſame Account. But this *Effect* belongs mainly to the true *Maſtack*, or *Opo*, that drops from the *Inciſions* made in the *Heads* of the *Poppies*, more eſpecially the *Theban*, which affords a moſt powerful *Juice*, for Exulcerating or Bliſtering is but a ſtronger, fuller, and therefore *painful Reſolution*, as you ſee by the Cuticle upon Bliſters reſolved into a kind of Jelly.

5. It is *Pſilothrick* for the ſame Reaſons, for while it ſo reſolves the Parts, it looſens the Roots of the Hair, and ſo cauſes its ſhedding.

6. It *hurts the Eyes*, becauſe of its Acrimony, by Reaſon of the *Volatile Salt*.

7. It *cauſes Itching in the Skin* by the *Titillation* of the ſame *Volatile Salt*, as you find by the Application of *Squills*, and the like.

8. It *excites Venery*, by the ſame *Titillation*, on the *Veneral Membranes*.

CHAP.

CHAP. XVII.

The Explication of the Effects of Opium *used internally in a moderate Dose.*

NOte, That becauſe *Opium* has been generally hitherto uſed either *Crude*, or with its *Roſin* in it, the *Effects* of *Opium* are accordingly conſidered as *common Experience* thereupon has given *Opportunity* of *Obſerving* them; but as I proceed I ſhall ſhew you where the Reſinous Part of *Opium* is concern'd in the *Effect*.

1. It is manifeſt why *Opium* may well operate in a very *ſmall Quantity*, as it uſually does, becauſe the leaſt Matter imaginable *affects* the *Senſes*, (as has been ſhewn;) for the Thouſandth Part of a grain of *Ambergriſe*, *Muſk*, *&c.* affects the *Smelling*, the Hundredth Part of a *Grain* of very acrimonious Things the *Taſte*, which cauſes very ſenſible *Pleaſure*, or *Diſpleaſure*, according as it is agreeable, or not; much eaſier may the exquiſitely diſpoſed *Membrane at Stomach*, which is affected with Things ſo indefinitely ſmall, that no other *Senſe*, or *Membrane*, can take notice of, as the Particles of *Crocus Metallorum* in *Vomits*, *Effluviae* from a *Cats Body*, *peſtiferous Effluvias*, and the like; of all which the *Stomach* is ſo ſenſible, that they thereby cauſe moſt violent Symptoms, which are (as was ſhewn) proportioned to the Senſation. Therefore it can be no *wonder*, that a *Grain*, or *leſs*, of *Opium*, ſhould affect the ſenſile Coat of the *Stomach*, and thereby cauſe a Senſe of *Pleaſure*; for that which is nice to diſcern grieving *Particles*, is ſo to diſcern pleaſing ones,

(as has been ſaid.) *Cujus eſt Dolor ejuſdem eſt Voluptus*, that is, *Pleaſure*, and *Diſpleaſure*, belong to the ſame Part, and (as was ſhewn) in *equal Degree*.

This proves, That it muſt Operate by pleaſingly affecting the *Stomach*, for it were otherwiſe impoſſible, that ſo little a *Quantity* ſhould cauſe ſuch *remarkable Effects*, and that before the *Opium* is out of the *Stomach*; but it is ordinary for the *Stomach* to cauſe *mighty Effects* by its Senſation of very ſmall Things, otherwiſe inſenſible and inconſiderable as to the Production of any obſervable *Effects*; and therefore it would be a Miracle, if it did any other *Way* cauſe ſuch great and numerous *Effects*. *Helmont* obſerved, That *Pro Remedio reſtaurativo Archæi (ſive Animæ ſenſitivæ) non requiritur Unciarum & Drachmarum Quantitas, ſed pauca Grana*; That is, *Very little ſerves to comfort the Archæus* (*or Senſitive Soul*;) becauſe it is done by *Senſation*, (as I have proved.)

2. It is as evident how a hot, briſk, and *Salino-volatile* Thing, as *Opium* is, muſt affect the *ſenſile Coat* of the *Stomach* in a *ſhort Time*, as *Vomits*, *Purgers*, *&c.* do; which it does much in the ſame Time with thoſe Things, that is, as ſoon as they inſinuate themſelves through the *Cruſta Carnoſa* of the *Stomach*, and reach its *ſenſile Coat*, which is the Reaſon that *Opium*, *Vomits*, *Purgers*, *&c.* make ſome, and like *Delay*, before they *Operate*; which is alſo a Proof, that all of them Operate by affecting the *ſenſile Coat* of the *Stomach*, all the Difference being, that one affects pleaſantly, as *Wine*, *Meat*, and *Cordials*, and the other by a *grievous Senſation*.

The

The Explication of the Conſtant Effects of Opium *uſed internally*, &c.

1. *The firſt and leading Effect of* Opium is, cauſing *a moſt agreeable, pleaſant, and charming Senſation about the Region of the Stomach.* This is a *Property* that belongs to it *omni & ſemper*, and indeed *ſoli* to *Opiates*, if the Degree, Duration, and Fineneſs of the *Pleaſure* be *conſidered.*

How manifeſt is it, from what has been ſaid of the moſt Compleat and Conſummate *Sal-Volatile-Oleoſum* of *Opium*, which exactly agrees in Principles, *&c.* with *Semen Animale*, that ſo highly pleaſes and titillates the *Membranes*, with which it not only agrees in *Principles*, (as was ſhewn) but has them more *active*, *actuating*, and *titillating*, than any *Membrane*, that it muſt of neceſſity highly pleaſe all *Membranes*, more eſpecially ſuch as are moſt exquiſitely diſpoſed for Senſation, as the moſt *ſenſile Membrane* at *Stomach* is, not only by its *Agreeableneſs*, but by a moſt Charming and Captivating *Titillation*, that actuates and cauſes a fine Ovation, and ſerene glowing of the *Spiritus inſiti* of the *Stomach*, which makes it pleaſing in the higheſt manner, having all the *Requiſites* to cauſe a Senſe of *Pleaſure!* and that is not all, *but it being taken into the Body, it cauſes a long, continued, and permanent ſenſe of Pleaſure, which we muſt neceſſarily carry along with us as a* Vade Mecum, *even Sleeping or Waking, Reſting or Moving, or whatever we do, or wherever we are*; by which *Means*, it far excells all other *Pleaſures*, and conſequently produces ſuch mighty *Effects*; all other *Pleaſures* being *momentary*, *tranſitory*, *deſultory*, or *interrupted*, except that of *Wine*, and

Cordials at *Stomach*, which therefore have the *likeſt Effects* to that of *Opium*, tho' they do not equal it in the *Intenſeneſs* or *Duration* of the *Pleaſure*, unleſs they are repeated, (as indeed they may be) which made me to intimate, That drinking a good *Glaſs* of *Wine* every *Hour*, and by that Means keeping the freſh *Pleaſure* thereof continually at the *Stomach*, (like that of *Opium*) is the beſt Way to cauſe a long *Euphory* of *Labour*, *Journeys*, *&c.* which may come near the Performance of our *Divine Sal-Volatile-Oleoſum* of *Opium*, tho' never equal it for Reaſons already ſufficiently hinted, *viz.* becauſe *Wine* wants its moſt agreeable Compoſition, and fine *Titillation* of the *Volatile Salt* that *Opium* and *Animal Seed* have.

Note, That the *Pleaſure* of *Opium* may, to ſome inadvertent *Perſons*, ſeem very indefinite, tho' it is at *Stomach*, (as it muſt be) becauſe the *Pleaſure* immediately relaxing all Parts, and gratifying the Senſitive *Soul*, which informs the whole, ſeems to be *general*, tho' Originally only at *Stomach*.

2. Our *Conſummate Sal-Volatile-Oleoſum* muſt cauſe a *blith*, *gay*, *and good Humour*; for being pleaſed with any Thing (as is the *Vulgar Obſervation*) cauſes a *good Humour*, how much more muſt ſuch an *intenſe*, *agreeable*, and *continual Pleaſure*, that we always, and every where carry along with us, ſo do! How common a Saying is it, *He was pleaſed with ſomewhat, for I found him in a good Humour!*

3. The like is to be ſaid of *its cauſing Promptitude*, *Serenity*, *Alacrity*, *and Expediteneſs in Diſpatching and Managing of Buſineſs*; for theſe are but natural and neceſſary Conſequences of a *blith*, *gay*, *and good Humour*, and therefore always go together; for the *ſenſitive Soul* being put in

in a *fine Ovation*, by the *continual Pleasure*, is more active; and having thereupon (as was shewn) wholly excused himself from the *Care*, and solicitude of the *Defensive Contraction*, and, in great Measure, of the *Vigilative Contraction* also, is more at *leisure* to attend the Managery of other Affairs without *Distraction*; besides, that he is *actuated* and *enliven'd* by the aforesaid *Ovation* of the *Spirits*, and pleasing *Titillation* into an *Alacrity* and *Promptitude* for any Business; with which also he is less tired, because he has (as was said) rid himself of the *Fatigue* of the *Contractions*, that (as was manifestly proved) do cause *Lassitude*, which otherwise can hardly touch or affect him at all in the State of *Relaxation*.

4. *It must cause Assurance, Ovation of the Spirits, Courage, Magnanimity*, (as *Wine* does) by elevating the *sensitive Soul* by *Pleasure*, and a high *Titillation* of the *Spiritus insiti*, by its *Volatile Parts* actuating them, as the *Animal Semen* does all *Creatures* in *Times* of *Copulation*, tho' it immediately affects only the *Venereal Membranes*, but ours does actuate them not only in those *Membranes*, but also in the more exquisitely disposed *Membranes* for Sensation at *Stomach*, and soon after, all over the *Body*.

5. *It prevents and takes away Grief, Fear, Anxieties, Peevishness, Fretfulness, &c.* for the aforesaid *Reasons*, which cause a *blith, gay*, and *good Humour, Promptitude, Courage, &c.* for it is impossible to be *gay*, and *good Humour'd, Serene, Chearful, Courageous*, and *Magnanimous*, and at the same Time *Sorrowful, Fearful, Peevish, Fretful, &c.* If the bare Sense of an ordinary *Meal* of *Meat* at *Stomach*, which causes but a slow *Pleasure* in comparison with *Opium*, takes off the *Peevishness, Fretfulness, &c.* that the *grievous Sensation* of *Hunger* causes, how much more must the intense and *charming Pleasure* caused by *Opium*, that is so agree-

able, even far beyond *Wine* it ſelf, (as has been ſet forth) take away all ill *Humours*, *Fretfulneſs*, *Peeviſhneſs*, *&c.*

Obj. But it may be ſaid, That *Sleepineſs*, which depends alſo upon *Relaxation*, as the *Effects* of *Pleaſure* do, cauſes a *Peeviſh*, *Fretful Humour*, as is commonly obſerved.

Anſ. It is ſo far otherwiſe in the Caſe of *Opium*, that it is quite contrary; for, 1. The Sleepy are not Peeviſh, unleſs you put them by ſome Means out of the *Pleaſure* of enjoying *Sleep* or *Relaxation*, for if you let them alone they will not trouble you with Peeviſhneſs, nor any ill *Humour*; but it is the calling them from their *relaxed Condition*, to the grievous Task of *Contractions*, that vexes them; ſo that it is the *Want* of continuing under the *Relaxation* that frets them, and the more, becauſe the *Fatigue* and *Tedium* of *Contraction* did put them upon the *Relief* of *Sleep*, of which if diſappointed, they are much vexed.

But in the *Caſe* of *Opium*, you cannot ſo eaſily rob them of their *Pleaſure*, which they carry continually within them in an uninterrupted manner, unleſs ſome very *grievous Thing* happens, which cauſes more *defenſive Contraction* than the *Opium* cauſes *Relaxation*; tho' even this alſo is generally ſoon overcome by the *Pleaſure* continually inviting the *Relaxation*, and promoting it, whereas the *Interruptions* thereof are *tranſitory*; but at the worſt it is but taking more *Opium*, and the *Work* is done; for, I obſerve, that the *Doſe* of *Opium* muſt be ſufficient to introduce ſuch a Senſe of *Pleaſure* as cauſes a *Relaxation* of the *Contraction* cauſed by the *Grievance*: Hence it is certain, that a greater *Pain* requires a larger *Doſe* of *Opium*, (as has been intimated.)

6. All

6. All know, that *Pleasant Diversions*, as *Musick*, *Pleasant Jests* and *Stories*, *fine Sights*, *&c.* do cause *Euphory*, and *an easie undergoing of Journeys*, *Labour*, *&c.* Therefore, if such interrupted, transient, and slight *Pleasures*, do it so much, it will be easily granted me, that a continual, and more *intense Pleasure*, that is always present without any *Interruption* or *Intermission*, (as that of *Opium*) must cause a more eminent and permanent *Euphory*, proportioned to the *Pleasure*, which causing *Relaxation*, prevents the *Fatigue* (or *Lassitude*) that is caused only by *Contractions*, either *Vigilative*, *Defensive*, or *Intentive*, (as I have proved.)

So that I do not conceive, how the *Noctambuli* (or such as Walk in their Sleep) can ever be tired, if they Travelled ever so far, (if they could Eat and Drink) because the *Relaxation* of the *Sleep* recruits them as much as they spend of *Spirits*, *&c.* so Persons that cause such *Relaxation* by *Opium*, and so repeat it as to maintain the *Relaxation*, can hardly be weary; which is the true, plain, and *Mechanical Reason*, why the *Turks*, and other *Eastern People*, do, by the Help of *Opium*, perform prodigious *Journeys* without being tired; which may therefore (in *Allusion* to the *Noctambuli*) be call'd *Opiambuli*, (or *Opambuli*) as being a kind of Artificial *Noctambuli*, because they are much relax'd by the *Pleasure* that *Opium* causes, as the other are by *Sleep*. *Qui Lætitiâ afficiuntur* (says *Sanctorius*) *nullam in Itinere Defatigationem sentiunt*; That is, *The Merry are not Weary*, (as the Saying is) because Mirth, being pleasant, causes *Relaxation*, as *Opium* does, in some measure.

Note, That as to all the foregoing *serene* and *brisk Effects*, a full and liberal *Perspiration*, which it also causes, (as will be shewn) contributes much thereto a *posteriori*; for, as *Fire* burns slowly and dully, if the Smoak does by any means return upon it, and very *serene* if not, so it is with the *Flame* of *Life*, if clouded with, or clear'd from *Vapours* by *Perspiration*. Sanctor. Sect. 7. Aph. 17. *Melancholia superatur liberâ Perspiratione*, & *Aph.* 30. 31. *Edulia aperientia Gaudium movent*; That is, Such as open the *Pores*, and cause *Perspiration*, cause *Joy* or *Mirth*.

7. It *lulls*, *soothes*, *and*, *as it were*, *charms the Mind with Consent and Acquiescence*, for the several Reasons couched in the Premises, and because the *fine*, *continual*, and *charming Pleasure* of *Opium*, (such as some *Glasses* of *generous Wine* causes) must needs have such an *Effect*.

8. It *quiets*, *allays*, *and composes all Perturbations and Commotions of the sensitive Soul*, *Spirits*, *&c.* 1. Because it so *lulls*, *soothes*, and *charms* the *sensitive Soul*, (as is aforesaid) who is the Original of all *Motions* in the *Animal*. 2. Because all *Motions* are, by the *Relaxation*, proportionably abated (as was demonstrated.) Thus *Opium* takes off *Hysterick Fits*, *Fevers* from Commotions of the Spirits, *Convulsions*, *Stops Hemorrhages*, (or *Bleeding*) *&c.*

9. *It causes a Relaxation of all the sensile Parts of the Body*, by Reason of the great and continual *Pleasure* that it causes; and how *Pleasure* causes *Relaxation*, I have shewn in *Chap.* 14.

10. *It causes Indolence*, *or Exemption from Pain*, by causing so high and lasting a *Pleasure*; 1. Because that *Pleasure* takes up the *Attention* of the *sensitive Soul*, who delights in't. 2. Because a *sense of Pleasure and Pain* cannot be at the *same Time* in the *same Subject*, being they are *Contraries*.

3. Be-

3. Becauſe the *Membranes* being relaxed, and the *Animal Spirits* expanded, the Impreſſions of Pain cannot be carried to the *ſenſitive Soul*, becauſe they cannot convey *Impreſſions* ſmartly being thus relaxed and expanded, (as has been demonſtrated by the Compariſon of a *Gut* half full of *Air*, *&c.*) and all *Impreſſions* of *Pain* muſt be ſmart, or elſe they are not *Impreſſions* of *Pain*; for gentle *Impreſſions* are ſuch as belong to *Oils*, *ſmooth*, and *ſoft Things*, or when the *Animal Spirits* can hardly carry any *Impreſſions*, but gently, as in *Sleep*, and other *Relaxations*, as that upon *Pleaſure*, *&c.* which is our Caſe.

Note, That it will cauſe *Indolence* without cauſing *Sleep*, becauſe *Sleep* requires *Relaxation* and *Quiet of the Spirits*, but *Indolence* requires only *Relaxation*, (as was ſhewn) which always follows the charming *Pleaſure* of *Opium*.

11. It *ſtops*, *moderates*, *or palliates moſt Fluxes*, and promotes *Perſpiration*; becauſe the *Relaxation* takes away the ſenſe of the *Irritation* of Humours, which cauſes a *Contraction* to ſqueeſe them out, and that the ſame *Relaxation* opens the *Pores*, to let the *Fumes* out, which paſs by their own *Levity* upon the opening of the Pores. *Nihil magis* (ſays *Sanctorius*, Sect. 7. Aph. 6.) *reddit liberam Perſpirationem quam Animi Conſolatio*, *(aut voluptas)* & Aph. 19. *Animi Conſolatio*, *quacunque de cauſâ*, *aperit meatus*, *& largam Perſpirationem facit*.

Now you may perceive why *Opium*, and good *Cordials*, do moderate *Fluxes* by *Stool*, even before they are out of the *Stomach*, becauſe the *Pleaſure* there cauſed *relaxes* all *Parts*, and thereby cauſing an *Expanſion* of the *Animal Spirits*, the ſenſe of the *Irritation* is loſt, becauſe the *Expanded*

Spirits

Spirits cannot carry the *Impreſſions* ſmartly to the *ſenſitive Soul*, which muſt be, to cauſe a *ſenſe* of *Irritation*, or *grievous Senſation*: By the *ſame Reaſon*, only warm *Trenchers* applied to the *Belly*, or ſitting upon a *warm Stool*, *&c.* moderates a *Looſeneſs*, becauſe the *Pleaſure* of the *Warmth* relaxes, and ſo takes away a ſenſe of the Irritation by the aforeſaid *Expanſion* of the *Spirits*.

12. *I have juſt now ſhewn how it promotes inſenſible Perſpiration, viz.* by the *Relaxation* opening the *Pores*, and letting out the *Fumes*; which I need not have mentioned again but for Order ſake, that all may thereby ſee, that I evade the *Explication* of no Effect, nor, indeed, need I, for they are now obvious enough, even without my *Explication*, to any *Sagacious Perſon*; ſo that the *Plainneſs* may give greater cauſe to paſs over ſome untouched, than the *Difficulty*; but it is not fit that either ſhould cauſe any Omiſſion in ſuch a *mighty Concern*, that was never Explicated, and ſcarce ever thought poſſible.

13. *Opium prevents Shiverings in Ague Fits*, becauſe that (for the Reaſons aforeſaid) it takes away the ſenſe of the *Irritating Humours* that cauſes them.

14. *It prevents and cures Colds*, by the *Relaxation* that its *Pleaſure* cauſes, whereby the *Pores* are kept very open, and *Perſpiration* (as was ſhewn) promoted. Beſides, that it preventing the Senſation of, hinders it to conſtringe the Pores, by cauſing a grievous Senſation.

15. *It cauſes a larger and ſlower Pulſe*, becauſe of the *Relaxation* that the *intenſe* and *continual Pleaſure* cauſes, by which the *Arteries* are widened, and the Motion made ſlower; 1. Becauſe the *Animal Spirits* are weakened by the *Relaxation* of their Veſſels, and their *Expanſion* thereupon. 2. Becauſe the ſenſe of *Irritation*, by which the *Heart* is ſolicited to move faſter, is loſt.

16. *It*

16. *It causes Drineſs in the Mouth*, (as Sleep doth;) 1. Becauſe the *Dilatation* of the Glandules, by the *Relaxation*, detains and ſuſpends the *Humours*; and 2. Becauſe the Senſation being leſſen'd, the Membranes that include the *Salival Glandules* are not irritated to *Contraction* to ſqueeze out the *Saliva* (or Spittle.) 3. Becauſe the *Pulſe* is ſlower to cauſe an Extruſion of the Humours.

17. *It has moſt Effect in warm and moiſt Weather*, becauſe both Warmth and Moiſture promote *Relaxation*, by which *Opium* does (upon the Account of the Pleaſure it cauſes) perform its *Effects*.

18. *It has more Effect upon fine and lax Textures*, for the ſame Reaſon, and becauſe their *Senſation* is more nice, and affected more with Pleaſing or Grieving Things: Therefore it affects *Children* and *Women*, eſpecially the Nice, and Delicate, more than Men; which may be the Reaſon why *Women* do not uſe *Opium*, in the *Eaſtern Countreys*, as much as *Men*.

19. *It cauſes an Efflorescence* (or Redneſs) of the Skin, (as *Sleep* or *Wine* do) becauſe the Skin being relaxed, admits the *Bloud* to come into it very freely, as *Cold*, *Fear*, *&c.* contracting the *Parts* of the *Skin*, repel it, or ſqueeſe it out, or back again; Thus Perſons that drink much, get Red Noſes, by frequent *Relaxations* of the Skin, which widen the Roads of the Bloud more and more; Hence it is that the Bags at a Turky-Cock's Neck are red when he is pleaſed, and ſoon pale again when diſpleaſed.

20. *It affects the Genus Nervoſum, or Animal Spirits*, (which is a common Obſervation) *more than the Bloud*, becauſe it Operates by affecting *Senſation*, wherein the *Nerves* and *Membranes* are moſt concerned, and not by *altering the Bloud*, to which it bears no *Proportion*, to cauſe any remarkable *Effects*.

Note,

Note, How plainly this *Concession* of all *Authors* confirms what I said, *viz.* That it does not operate as an *Alterative* of the *Bloud*, *&c.* but by *affecting Sensation*, as I have proved.

21. *It increases Seed in some Measure*, because it administers a *Sal-Volatile-Oleosum* of the same Nature with it, and by its *Titillation* solicites and invites the sending of its Matter that way, as is observable in such as use much *Titillation*; but to speak *plainly* and *mechanically*, I think that this mainly happens, because of the *Relaxation* of the Parts admitting (as was said of the *Efflorescence* of the Skin by *Relaxation*) the *Bloud*, or Materials of *Seed*, more freely into the *Testicles*, and all the *Seminary Vessels*, especially, being that the *Titillation* causes an oftener emptying of the same, in order to receive those Materials with less *Opposition*, for *Quod intus est prohibet alienum*, that is, *What is within hinders the entrance of other Matter*; Nothing can receive more than what it can contain, but what is often emptied can successively receive much.

22. *It causes a great Promptitude to Venery, Erections, &c.* (especially if the *Dose* be larger then ordinary) because being of the same *Principles* with *Animal Seed*, and (in all *probability*) somewhat more *titillating*, and of like *Principles* (tho' more gentle) than *Cantharides*, it must highly *titillate* those Parts, and consequently cause a great *Promptitude* to *Venery*.

CHAP.

CHAP. XVIII.

The Explication of the frequent (tho' not constant) Effects of Opium, *in a Moderate Dose.*

1. IT *causes Sleep*, because it highly disposes thereto by the *Relaxation* that its *Pleasure* causes. Thus *Musick*, *agreeable Frications*, and many other *Pleasures*, nay, all that are consistent with *lying*, or *sitting still*, and silent, incline us to *Sleep*; but none can compare with the *sweet*, *continual*, and *transcendent Pleasure* of *Opium*, that we carry along with us for many *Hours*; whereas other *Pleasures* are either remiss, or interrupted, or transient in their *Nature*; for *continuance* in gentle *Pleasure*, as the fall of *Waters*, *Whistling of Winds*, effects much towards Sleep, so *Intenseness* does also, tho' *momentary*, as that of *Venus*; how much then must a *continual* and *intense Pleasure* cause it, especially when *Rest*, *Silence*, *&c.* is added thereto.

Note, That *Sleep* is so far from being a *Property* of *Opium*, that it does not belong to it *omni*, *soli*, or *semper*; yet *People* have generally look'd upon *Sleep* as such, which caused many *Errours*.

2. *It causes pleasant Dreams*, because the very *Sleep* is caused and continued by *Pleasure*, when it is by *Opium*; which *Pleasure* being all the *time* we Sleep within us, must needs suggest *pleasant Dreams*, or none, for how can sad and *melancholy Dreams* seise one that is in a *gay* and *pleasant Condition*, as far as one in *Sleep* is capable thereof.

3. *It*

3. *It ſtops Vomiting*; 1. As it doth other *Fluxes*, by taking away the *ſenſe* of *Irritation*. 2. By highly pleaſing, and thereby *quieting* and *compoſing* the *Commotion* of the *Stomach*. 3. By relaxing it, which oppoſe the *Contraction*, by which Vomiting is perform'd.

4. *It ſtills Hiccoughs* for the ſame Reaſons.

5. *It cauſes Convulſions and Contractions to ceaſe.* 1. Becauſe it induces a *Relaxation*, which takes them off. 2. By taking off the ſenſe which the *Irritating* cauſes. 3. By *compoſing* the Spirits.

6. *It cauſes the Meat to ſtay long at Stomach*, (as Sleep does;) 1. *By relaxing the Stomach*, ſo that it is not ſubject to *contract* to ſend it out. 2. *By ſtilling all Motions*, whereby the *Stomach* grows proportionably unactive. 3. Becauſe the *Relaxation* oppoſes the *Contraction*, by which the *Menſtruum* is ſent into the *Stomach*, or the *Saliva* into the Mouth; both which are therefore much wanted in *Sleep* for the like *Reaſon* (*as has been ſhewn.*)

7. *It moderates and prevents Hunger*; 1. Becauſe (as was ſaid) the *Menſtruum* is not ſo plentifully ſent or ſqueeſed into the relaxed *Stomach*. 2. Becauſe it takes away the ſenſe of *Hunger*. 3. Becauſe it leaves the Meat to ſtay too long at *Stomach*, by *Reaſon* that it is relaxed, more inſenſible and proportionably languid in motion (as in *Sleep.*)

8. *It cauſes Sweat*, when the *Body* is full of *moiſture*, (as *Sleep* doth) by relaxing, and thereby opening the *Pores*; and not (as People commonly talk) by attenuating, and the like, for a *Grain* of *Opium* bears no *Proportion* to the *Bloud* and *Humours*: That it cauſes it meerly as *Sleep* does, is manifeſt, not only becauſe it bears not a due *Proportion* to the *Work*, as an *Alterative*, but becauſe Men do not Sweat in that Caſe (as in *Sleep*) without much moiſture in the *Body*, where-

as

as much would not be attenuated as ſoon as leſs: Therefore it is only an *Exudation* of the Humours upon a Plenty thereof, and opening of the Pores. *Sanctorius*, *Sect.* 1. *Aph.* 22. "*Inviſibilis Perſpiratio fit* "*viſibilis, quando Nutrimentum eſt nimium*; That is, *Inviſible Perſpiration becomes viſible (Sweat) when nouriſhment (or moiſture) is too much*, which exactly agrees with that of *Hippocrates* cited in *Chap.* 13. Ἰδρὼς πλὺς, &c.

9. *It cauſes the Menſes to flow*, when nothing is wanting but the opening or relaxing of the *Viæ* or *Pores* they iſſue out at, as when they are naturally too narrow and cloſe; as upon the firſt Tendency to them in *young Girls*, or when ſtopt by *Reaſon* of any undue *Contraction* thereof, as by *Pain*, *Cold*, *Sorrow*, or other *grievous Paſſions*, all which do cloſe the *Pores*. Beſides, it does irritate thoſe very ſenſile *Venereal Parts* to *Erection*; and I have reaſon to think, that it does by a *general Relaxation*, cauſe an *Increaſe* of *Blood*, as it does of the *Breaſts*, *Milk*, &c. cauſing, as it were, an *Artificial Puberty*, or (at leaſt) much promoting the *Natural*, and therefore is of excellent *Uſe* in this Caſe in Judicious Hands, tho' little thought of in *Practice*.

Obj. Here I may be ſure of an *Objection*, That it ſtops all *Fluxes*, but *Sweat* or *Perſpiration*.

Anſ. It is as *falſe* as it is a *common ſaying*, if they do not mean only ſuch *Fluxes* as proceed from *grievous Senſation*, and *Contraction* thereupon; for how can that which relaxes all Parts, ſtop any *Flux* that depends upon *Relaxation*? as *Stillicidium Urinæ* by *Relaxation* of the *Sphincter* of the Bladder, *involuntary Flux per Anum* by the Relaxation of its *Sphincter*, and ſuch like; ſo do I ſpeak of a *Flux* that may often depend upon *Relaxation*, (as I have ſhewn.) *Obj.*

Obj. But it may be *objected*, That it particularly ſtanches Bloud, how then ſhould it promote the *Menſes?*

Anſ. Experience tells me it does, and *Reaſon* confirms it: It *ſtanches Bloud*, by compoſing the Fury of its Motion, but that does not hinder, but it may relax the *Pores* for *Sweat*, *Menſes*, *Lochia*, *&c.* to paſs; and, why not for the *Menſes* and *Lochia*, as well as *Sweat*, by opening the *Pores*, I would fain know? conſidering alſo the *Titillation* that it cauſes upon thoſe *Venereal Parts*, which may very much ſolicite their *motion*.

10. *It cauſes the* Lochia *to flow* for the ſame Reaſons that it does the *Menſes*. This I have great *Experience* in.

Note, That the *Menſes*, *Lochia*, and *Perſpiration*, are Natural *Evacuations* that have *Pores* deſigned for them by *Nature*, the opening of which by *Relaxation* muſt make *way* for them: Suppoſe, when the *Bloud* flows ſo much into the Skin as to cauſe an *Efflorescence*, by the *Relaxation* thereof, after *Opium* is taken, that there were *Pores* to carry out *Bloud*, as there is for *Sweat*, why ſhould not one flow as well as the other? But there are ſuch *Pores* for the *Menſes* and *Lochia*, and large ones too, and therefore it muſt promote them; and why ſhould not *Relaxation* do it, as well as *Contraction*, by *Cold*, *Terrour*, *Grief*, *&c.* ſtop them? for *the Effects of Contraries are contrary*.

11. *It cauſes the Stone to paſs*; 1. Becauſe it relaxes and ſo widens the *Paſſage*. 2. Becauſe it moves with little or no *Pain*, which contracts the *Parts*, and ſo hinders its Paſſage, therefore the *Uſe* of *Opium*, with ſome other Helps, is the greateſt

greateſt Means that can be, or ever will be, for the *Stone*, till the *Diſſolution* of it is found out, not only to give *Eaſe* in the *Caſe* of the *Stone*, but to cauſe it to paſs; for both which *Purpoſes* it excells all Things, and doth both at once.

12. *It cauſes the Delivery of Women*, by relaxing the Neck of the *Womb*, as it does that of the *Bladder* to *deliver* Perſons of the *Stone*, but in the *Delivery* of *Women* it is not to be uſed but in particular Caſes, and by a very Skilful Hand; 1. Becauſe it is apt to take off all the *Womens Pains*, and Throws, and ſo quite diſappoint the *Delivery* for a day, 2, 3, 4, or more ſometimes. 2. Becauſe it cauſing a great *Relaxation*, the Parts after *Delivery* will be very unapt to cloſe and contract duely as they ſhould in ſuch Caſes, otherwiſe ſeveral Inconveniences may enſue. 3. It may be pernicious upon the Account of the Evacuation of Bloud that then happens. But theſe Things belong more properly to the Uſe of *Opium* in *Cure*.

13. *It cauſes Deadneſs of the Eyes*, (as in *Drunkeneſs*, *&c.*) becauſe the *Cornea* is relaxed, ſo that the *Humours* do not fill it up to a *tenſe Rotundity*, as when 'tis more contracted.

14. *It cauſes the* Pupilla *to dilate*, becauſe of the ſame *Relaxation*.

15. *It cauſes a Growth of the Breaſt*, *Penis*, *and Increaſe of Milk*, by Reaſon of the ſame *Relaxation*, as the Pleaſure of the *Semen* upon *Puberty* does, or as *Emollients* and *Relaxers* applied to the *Breaſts*, increaſe Milk, *&c.* by making more Room for it, *&c.*

16. *It cauſes Venereal Dreams*, becauſe of the *Titillation* of the *Venereal Membranes* that it cauſes.

17. *It cauſes Nocturnal Pollutions* for the ſame Reaſon, and becauſe it *relaxes* the Parts.

18. *It cauſes Itchings in the Skin*, becauſe of its *Titillation* by its *Volatile Salt*.

19. *It cauſes much Urine*, as *Cantharides*, *Bees*, *Piſmire*, *Millepedes*, *&c.* do, by its *Volatile Salt*, which titillates and irritates thoſe Parts, by its relaxing the Pores of the Kidneys, and rendring the Humours more penetrating, in ſome meaſure, by the *Volatile Salt*.

20. *It cauſes a Nauſea*, by its *Roſin* ſticking to, and teazing the ſenſile Coat of the *Stomach*. The Reaſon why it is generally ſo long before it cauſes a *Nauſea* or *Vomiting*, is, that its *Pleaſure* does at firſt prevent it, till at laſt the ſticking Roſin urges it by its long Stay, and vexatious Adherence.

21. *It cauſes Swimmings in the Head* by Conſent, when the *Stomach* is grieved by that *Roſin*, as you find upon *Nauſeas before Vomiting*, or when any Thing does much offend the *Stomach*, as much *Drink* or *Wine*, which when they have Vomited, thoſe *Swimmings* ceaſe.

22. *It cauſes Watching* in ſome Perſons, who are of very *moveable Spirits*, by actuating and ſtirring their Spirits by its active *Volatile Salt*, tho' it does at the ſame time pleaſe the *Membranes*, and conſequently relax the ſenſile Parts, and thereby cauſe *Indolence*, the Effect of *Relaxation*; which it alſo does, when People keep themſelves from *Sleep* by *voluntary Motion*, and therefore takes away *Pain*, even when Men Travel, *&c.*

Beſides, there are ſome ſort of Perſons, that upon *Joy*, *good News*, *Pleaſure*, or the like, are too much *elevated*, or have a *reſtleſs Ovation* of the *Spirits*, which will not ſuffer them to *Sleep*, tho' they are in a *Pleaſant Condition* all the time; This may be the Caſe of ſome that cannot *Sleep* after *Opium*, tho' they are all the Time (as they call it) in a *Heavenly Condition*, for (as I have ſaid) a

Quietneſs

Quietneſs of the Spirits is requiſite to cauſe Sleep, as well as *Relaxation*, but *Relaxation* alone, and thereby *Expanſion* of the Spirits, ſo that they cannot carry *Impreſſions* ſmartly, is ſufficient to cauſe *Indolence*; and the *Pleaſure* to cauſe a *Heavenly* (or very *pleaſant*) *Condition*. Sanctor. Stat. Med. Sect. 7. Aph. 28. ſays, That *Lætitia perſeverans per multos dies ſomnum impedit*; *Perſevering Pleaſure* may do the ſame, by like *Reaſon*, that is, too much Agitation or Ovation of the Spirits.

Sometimes too large a *Doſe* cauſes *Watching*, by over-actuating and exciting the *Spirits*: *Medicum vini generoſi, & Allium* (ſays *Sanctorius*) *conciliant ſomnum, & Perſpirationem, ſi vero plus juſto ſumantur, utrumque prohibent, perſpirabile tamen in Sudorem convertunt*, that is, *A little generous Wine and Garlick will cauſe Sleep and Perſpiration, but too much hinder both, yet they convert the perſpirable Matter to a Sweat*; which *Wine* and *Garlick* have the Nature of *Opiates*, and the Reaſon why they Sweat, is, the *Quantity* of the *Wine* affording more Moiſture, *Hippocrates* ſays.

23. *A dubious State between Sleeping and Waking*, is cauſed, when the *Relaxation*, upon the *Pleaſure* of *Opium*, inclines to Sleep, but the irrequiete *Ovation* of the *Spirits*, by the *Pleaſure* and *Titillation*, will hardly ſuffer it, yet highly pleaſes, and puts them in a ſweet agreeable Condition.

CHAP. XIX.

The Explication of the rare Effects of Opium *in a Moderate Doſe.*

1. IT *cauſes temporary Pulſes of the Bl[illegible], and ſometimes of other Parts*, by its over-relaxing the *Parts*, and cauſing thereby an *Expanſion* of the *Elaſtick Spirits*, which (as was demonſtrated) weakens their *Motion*.

2. *Faltring of the Tongue* does (as in *Relaxation* by *Drunkenneſs*) proceed from the ſame Cauſe.

3. *Looſeneſs of the Lower Jaw*, as you ſee in the Drowſy and Drunken People, is from the ſame *Relaxation*.

4. *It ſometimes prevents Sweat*, by cauſing a very *Liberal Perſpiration* (as was ſhewn;) for (as *Sanctorius* ſays, who ſhould know it) much inſenſible *Perſpiration* and *Sweat* cannot conſiſt, eſpecially in a Temperate Perſon, who Eats and Drinks moderately; Therefore, if you keep a Perſon, that *Sweats* much at *Night*, in a free *Perſpiration* all *Day*, by the Help of an *Opiate*, you'll much leſſen or totally prevent the *Sweat* at *Night*, as in *Conſumptive Perſons*, &c.

5. *It cauſes Abortion*, by relaxing the Neck of the *Womb*, which alſo the *Pleaſure* of Coition ſometimes does for the like Reaſon, and would be much more apt to cauſe it if it continued long, as that of *Opium* does. *Note* the Inconvenience of *Coition* after *Impregnation*; This is the great Cauſe that *Whores* are not apt to bear Children, becauſe Frequency of Pleaſure does over-relax the *Collum Uteri*.

6. *It*

6. *It prevents Abortion*, when *Fear*, *Terrour*, or any contracting Cauſe, as *Grief*, *grievous Paſſions*, or *Senſations*, do threaten it, by its taking off the *Contraction* and *Grievance* that cauſes it.

7 *Intumeſcence of the Lips* is from their *Relaxation*, admitting the Bloud and Humours into them in a plentiful manner; beſides, that their *Laxity*, and the *Inadvertency* occaſioned by the Diverting *Pleaſure* or *Drowſineſs* that follows, letting the *Lower Lip* hang down careleſly (as is uſual in ſuch Caſes) may by expoſing much more of that *Lip* (which is moſt concern'd in this *Effect*) make it ſeem larger, as a hanging *Lip* does.

8. *It may cure a Dropſy*, (as Dr. *Willis* doth inſtance;) 1. By cauſing a free *Perſpiration*, which is much wanted in thoſe Caſes. 2. By relaxing the *Pores*, and making way for the *Humours* to paſs. 3. By cauſing much *Urine*, as *Cantharides*, *Millepedes*, *&c.* do, upon the Account of their *Volatile-Salt*, with which *Opium* abounds.

9. *It cures Stupors* that proceed from *Contraction*, as by *Cold*, *&c.* by relaxing all Parts.

10. *It cauſes Anxieties and Diſtreſſes*, by the *Reſin* ſticking and teazing the *Stomach*.

11. *Vomitings and Hiccoughs* proceed from the ſame *Cauſe*.

12. *Convulſions* are cauſed by the ſame *Reſin*, while it continually urges the *Stomach* to *grievous Vomitings*, which at laſt draw other Parts (as the *Stomach* uſually does when under great *Grievances*) into violent *Contractions* or *Convulſions* by conſent, to endeavour its *Aſſiſtance*, becauſe the *defenſive Contraction* growing very high by the almoſt intolerable and tedious Grievance at *Stomach*, cauſes a mighty *compreſſion* of the ſpringy *Animal Spirits*, by which Means they grow very forcible, irrequiete, and violently ſpringy, under the *urgency* of an enormous *Compreſſure*, which cauſes ſuch *Convulſive Motions*.

Note, That ſuch a *violent Compreſſion* of the *Animal Spirits* into a great ſpringineſs, is the cauſe of the Strength of *Convulſive Motions*, ſo that ſometimes a ſtrong Man can hardly hold a Child's Limb in ſuch *Caſes*.

13. *Syncopes*, *Leipothymies*, and *Faintings*, follow, when the *ſenſitive Soul* being quite *tired*, and *overborn* by the *Fatigue* of ſuch *Diſtreſſes*, *Vomitings*, and *Defenſive Contractions*, to reject and excuſs the ſaid adhering and teazing *Roſin*, yields it ſelf to *Reſt*, and lets go the Reigns of *Contraction* as being fruitleſs, and no longer endurable; whereupon all the *ſenſile Parts* being relaxed in the higheſt *degree*, they thereby grow unfit for Senſation, and the *Animal Spirits* expand as far as the *Atmoſpherical Compreſſure* permits them, ſo that they grow incapable to *convey Impreſſions*, by which means *Senſe* fails, and *Motion* alſo for the ſame Reaſon, becauſe the *Animal Spirits* looſe their *ſpringy Endeavours* for want of a ſufficient *Compreſſion* to render them flippant for the Purpoſe; which is the Cauſe (as in *Sleep*) that *Senſe* and *Motion* fail together; of the great *Perſpiration*, and all other *Effects* of *Relaxation* in ſuch *Syncopes* or *Leipothymies*, in a yet higher *degree* than in *Sleep*, wherein the *ſenſitive Soul* does not quite let go the *Reigns* of *Contraction*, as appears by the *Motions* that remain, as of the *Heart*, *Inteſtines*, *&c.* tho' far more remiſs in Sleep than in a Waking State.

Note, That ſuch *Leipothymies* are (as was hinted) of the ſame Nature as *Sleep* is, but that they are ſuddain, more profound, and not ſo uſual, natural, and of courſe, as *Sleep* is, which makes them more *amazing* and *ſurprizing*; *therefore* it follows, that they are (as *Sleep* is) a Means of *Recruit*, when

when all working and tugging by *Defensive Contractions* fail, and so the last *Refuge* of the *sensitive Soul*, when over-tired, in order to recover Strength for a fresh Engagement with the *Enemy*; (as being tired at *Night*, the *sensitive Soul* loosens the Rigns of *Contraction* to enable him the better to fall to his *Work* the next Day:) This you'll find by all *Reason* and *Experience* to be the true State of *Leipothymies* upon *Grievances* and *Fatigues*; tho' not hitherto minded (that I know of.)

Many true and useful *Consequences* do hence follow; as, That we are not always to disturb them, or put them out of these *recruiting Leipothymies* by grievous Means, as *Prickings*, *Pinchings*, *&c.* but only by *Cordials* and *Refreshing Things*, as you would Treat a Person much tired; or by letting them take their *Nap* (if I may so call it) if there be not very eminent Danger. But 'tis endless, and besides my Purpose, to make a particular *Discourse* of this Matter, which will belong more properly to my Tract of *Animal Mechanism*.

14. *Death* happens sometimes, tho' very rarely, and that in very *weak People* that take little or no *Sustenance*, because *either* when fallen into such *Syncopes*, they never come out of them, by Reason that they have not within them wherewith to recruit their *Spirits*, or, that *Opium* taking them much spent and tired with Distempers, causes, as in weak and wearied People, a most *profound Sopor*, which not recruiting them, who take or digest no Sustenance, they must rather grow weaker and weaker, (for somewhat is spent while we live) and consequently the *Sleep* or *Sopor* more and more *profound*, till they Sleep their last, for *want* of some *Recruit*, which is the very Thing that naturally lessens Sleep and awakes us, when there is no

other apparent Cauſe; for as the being *tired*, and *want of Recruit*, cauſes Sleep, ſo the *having it* cauſes *Waking*, or (which is the ſame in *Effect*) no farther need of *Relaxation* for Recruit's ſake, ſo that the ſenſitive Soul fall to his uſeful Work of *Vigilative Contraction* for *Senſe* and *Motion*'s ſake.

15. *It ſometimes cauſes Purging*, which happens (as far as I have obſerved, or can learn) only when it is given in a good Quantity to Perſons of a *ſtrong Digeſtion* or *canine Appetite*.

The Caſe is thus; When Perſons, that are of a *ſtrong Digeſtion*, take a *Reſinous Opiate* in good Quantity, they do in great meaſure by their fixed Salts at Stomach, and *ſtrong Digeſtion*, ſubdue the *Volatility* of the *Opium*, and diſſolve its *Roſin*, which then (as *acrimonious Roſins*, or *Vomits* ſubdued by *fixt Salt*, uſe to do) cauſes *Purging*; Hence it is, that it generally (if not always) Purges *Dogs*, and People of a high *canine Appetite*, and that ſometimes meeting ſuch fixed Salts, it Purges the *Conſumptive*. *Bartholine* ſays, That *Mandrake Juice purges when it meets with acrimonious fixed Salt*. *Eraſtus* and *Quercelan* do agree, That it has a *Purgative Quality*, but that it does not always exert it; 1. Becauſe it takes away the Senſe of *Irritation*. 2. Becauſe it is given in too ſmall a *Quantity*. The *Reaſons* are Juſt and Right, and not only conſiſtent with, but confirm what I ſay.

Note, That this is not intended of the *Purging* that happens after the *declination* of its *Operation*, which is (as you'll find) from another Cauſe, therefore this does not ſmell of the *Opium* as the other does, becauſe it is paſt and gone before that in the *Declination* happens; Of which more in its *proper Place*.

16. *It*

16. *It raiſes and revives ſome Perſons that are almoſt expiring*, in Two Caſes; *One* is, when ſuch as have been uſed to take it are even expiring for want of it (of which more hereafter.) The *other* Caſe is, when *violent Contraction*, as from *Pain*, *Cold*, *Vomitings*, and *Grievous Paſſions*, as *Terrour*, *&c.* are the Cauſe, that People are almoſt expiring, for it takes off the *Contractions* by relaxing, *&c.*

17. *It ſtays very long at Stomach*, when the *Roſin* thereof ſticks to the *Stomach*, and is there detain'd; Beſides, that the *Stomach* being relaxed, and having little *ſenſe* or *motion*, (as in *Sleep*) does not ſoon digeſt it or diſcharge it: It is fine in this Caſe, and all other, to obſerve how *Senſation* and *Motion* go Hand in Hand, keeping equal *Pace* and equal *Proportion*, as it plainly muſt be by the Principles of *Relaxation* and *Contraction*, which I have ſtated and proved.

18. *It cauſes ſtoppage of Urine* ſometimes (eſpecially in old *People*) by over relaxing, and cauſing a kind of a *temporary Palſie* of the *Bladder*, (as was ſhewn) and taking away the ſenſe of the *Irritation* of the *Urine*, which ſhould contract the *Bladder* to ſqueeſe it out; by which Means it happens ſometimes, that the *Bladder* comes to be ſo over extended beyond its due *Tone*, that they cannot contract it to make *Water*; in all which Caſes ſtrong *Contracters*, as *Cold*, *Terrours*, *&c.* immediately cures them; the very putting the *Scrotum* to the Edge of a cold Chamberpot has effected it ſeveral times by my *Advice*; tho' (if need be) you muſt come to Daſhing of *cold Water* upon the *Region* of the *Bladder*, or Pumping on it, or Dipping in it, *&c.* ſo *Terrour*, and cauſing a very ſmart *Pain*, eſpecially near thoſe Parts, will do much, but Cold is the readieſt and beſt *Remedy*,

19. *It*

19. *It sometimes proves dangerous after great Hemorrhages or Evacuations*, as Tapping in Dropsies, *&c.* because the *Relaxation* hinders the Parts duely to contract upon what remains, which may cause great Mischiefs, as *Discontinuation* of *Motion*, *&c.*

Thus have you all the *constant*, *frequent*, and *rare Effects* of *Opium*, taken *internally* in a *moderate Dose*, so naturally, easily, plainly, and mechanically explicated, that People may (in my Judgment) more admire, how all fail'd of discovering the manner of their *Production*, than that I found it; as Men are apt to think of the *Circulation* of the *Bloud*, which now (as I hope the *Effects* of *Opium* do) seems very obvious; both which Cases are to me very strong *Arguments* of a Being that *rules* and *disposes*, *darkens* and *illuminates*, *&c.* as he pleases, when I consider, that both the *Circulation of the Bloud*, and the *Cause of the Operation of Opium*, (*viz.* *Pleasure at Stomach*, *&c.*) fell under the Senses of many Millions, who in *one Case* saw the *Bloud* move, and in the *other* felt the *Pleasure*, yet was *neither* discovered for many Thousands of years; especially considering also, that in the *Case* of *Opium* Thousands of Ingenious Men have diligently enquired after the Cause of its *Operation*, who made no farther step in't than to state Things that have not as much as *Existence*, (*viz.* a *Cold Quality*, and *Fumes* flying from the *Stomach* to the *Head*) to be the Cause thereof. Therefore it is plain, That *neither is he that Planteth any Thing*, *neither he that Watereth*, *but GOD*, *that giveth the Increase*, of Knowledge, and of other Things: To whom be all Glory.

CHAP.

CHAP. XX.

The Explication of the Effects of the Declination of the Operation of Opium *in a Moderate Dose.*

1. A *General Return of all Diseases and Disasters,* when the *Operation* of *Opium* is over, because it does not (as was shewn) operate as an *Alterative*, but a *pleasing Diverter* of the *sensitive Soul* for some *Time*, during which it causes a *general Relaxation* of all the sensile Parts, whereby the *Animal Spirits* being expanded, grow unfit to convey *Impressions* smartly, which is requisite to cause a sense of Pain, *&c.* (as has been often said.)

But it cures several *Distempers, viz.* such as pleasing and comforting the *sensitive Soul, composing the Spirits, Relaxation, Perspiration, Sweat, &c.* can quite take away; Of which more particularly when we come to speak of the *Use of Opium* in *Cure.*

2. *Sweat* happens in the *Declination* of its Operation, as Sir *Theodore Mayern, my self,* and *others,* have observed, because that now all the *Parts* contracting, which by their *Relaxation* suspended all *Humours* during its *Operation*, do Mechanically squeese out the congested *Humours*, there being less *Room* in the *Body*, as was said of *Sweat* upon awaking, by the *Return* of the *Vigilative Contraction* after *Relaxation* during the Sleep, which is to be compared to the *Relaxation* during the Operation of *Opium*, and the *Return* of the *Contraction,*

traction, when 'tis ended; besides, that both upon the *Going off of the Operation*, and *Awaking*, the Motion of the Heart growing more vigorous, (as it does upon Motion by the *Intentive Contraction*) does more powerfully propell the *Humours* out at the *Pores* (as happens in *Sweat upon Motion.*)

3. *Frequent making of Water* happens, *partly* by the *Titillation* of the *Volatile Salt* (as by *Cantharides*, *&c.*) that is now separated from the Bloud; *partly* by the *Contraction* of the whole Body squeesing it out at the *Kidneys*, as when People are *Cold*, they make more Water for that Reason.

4. *A Looseness* may, and does happen sometimes from the like *Contraction* squeesing out the *Humours* that were suspended during the *Relaxation* by the *Opium*, which is common for such *Contractions* to cause, as by *Cold*, *Terrour*, *&c.* and because *Sensation* grows more *nice* and irritable by the *Humours*, by *Reason* of the *Contraction*, which is the more for the *Grievance* of failing of the Pleasure of *Opium.* Therefore,

5. *Diseases*, *Pains*, *&c.* seem worse upon the *Return* of the *Grievances*, because of the great *Ease* they had during the *Operation* of the *Opium*, *Contraria inter se magis elucescunt*; and it is particularly observed of *Pleasure*, That it leaves Men worse then it found them. Thus a Man is worse, more sad, *&c. Post Coitum*, more *Melancholy* after all sorts of *Pleasure*, insomuch that it is grown to a *Proverb*, viz. *After Merry comes Sorry*, (or, *After Mirth comes Sorrow*;) as also *Minus gaudebis*, *minus dolebis.* Therefore,

6. *Melancholy* does often (if not always) happen in some *degree*, after its *Operation* is ended; 1. Because of the Return of the *Contractions* (or *Toil*) of the *sensitive Soul.* 2. Because (as was said) the Sense of *Pleasure*, newly lost, aggra-

vates

vates the Sorrow, as has been ſhewn after *Coition, &c.*

7. *The Pulſe is narrow*, becauſe the *Contraction* returns with *Melancholy*, and *Return* of *Diſaſters* improve when that ſo happens, as it generally does.

8. *Itching of the Skin* happens about this time, becauſe that now the *Volatile Salt*, which cauſes *Titillation*, is arrived as far as the *Skin* upon its march out of the *Body*.

CHAP.

CHAP. XXI.

The Explication of the Effects of Opium *in an Exceſſive Doſe.*

THE *Cauſe* of moſt of theſe *Effects* will be evident from the Explication of the former, becauſe the *Difference* is only in the *Quantity* of the *Opium*, therefore I am often neceſſitated to ſpeak much the ſame as I have done before.

You cannot expect any *good Effects* from its *Exceſs*, any more than you have from *Wine*, (tho' the beſt of *Cordials*, next to the *Sal-Volatile-Oleoſum* of *Opium*) but rather leſs, becauſe *Opium* is join'd to a *pernicious Roſin*, which you may be ſure will be very grievous to the *Stomach* in great Quantities, if it was ſo in little.

The *Evil Effects* in this Caſe, do mainly proceed, *either* from *too much Relaxation*, as in *Drunkenneſs*, *or*, from the *Roſin at Stomach*.

1. *A Heat at Stomach* is cauſed by the intenſe *Heat* of the *Opium* in a *great Quantity*, it being ſenſibly a very hot Thing.

2. *The Senſe of Weight at Stomach* is cauſed by the *great Relaxation* that it cauſes, which renders the *Stomach* proportionably weak, and unable to endeavour its own *Relief*, ſo that the *Roſin*, *&c.* lie heavy upon't; Thus we find a *great Heavineſs* at *Stomach*, when any Thing grieves it, that it cannot reject or diſcharge.

3. *Gaity*

3. *Gaity of Humour is caused at first* (as by the *Pleasure* of a great Quantity of *Wine*) by its pleasing *Agreeableness* to the *Membrane* at *Stomach*, till the *Relaxation* grows enormous, as by a *great Dose of Wine suddenly drank*, to which it is very like in all its *Effects*, except such as proceed from the *Rosin* sticking at *Stomach*, which *Wine* has not.

4. *Sardonick Laughter* is caused (as you see in *Drunken People*) when they are disabled by the great *Relaxation*, that they cannot well Express themselves by the failing Tongue, they endeavour it by a silly kind of *fained* or *made Laughter*, (as they call it) while the pleasing *Titillation* at *Stomach* much inclines them to *Mirth*, if they knew how to manage and carry it on.

5. *Laxity, and consequently Debility of all Parts*, is caused by the extraordinary *Relaxation* of them by a continual and permanent sense of *Pleasure*, which happens considerably in the Momentary *Pleasure* of *Venus*, much more in this *continual* and *lasting Pleasure*, when a great *Dose* makes it intense, as in *Drunkenness*.

6. *Alienation of the Mind* is caused (as in *Drunkenness*) by an over-*Relaxation* of the *Brain* and its *Membranes*.

7. *Loss of Memory* happens by the same Means, (as in Drunkenness.) So,

8. *Darkness of Eyes* is caused by a *Relaxation* of the *Coats* and *Membranes* of the *Eyes*, but mainly by the *Expansion* of the *Animal Spirits* by that *Relaxation*, which (as in Sleep) renders them unfit to convey the *Impressions* of *Light*, *&c.*

9. *Laxity of the Cornea* is from the same *Relaxation*.

10. *Appearance of various Colours* happens by (as was said) the unevenness of the *Cornea*, *&c.* when so relaxed, whereas when 'tis duely contracted it is round, even, polite, and truely represents Things.

11. *Dead-*

11. *Deadneſs of the Eyes to the View*, is (as has been ſhewn) from the *Laxity* of the *Cornea*, which makes it flag, lie looſe, look dully, and not duely reflect a *ſmart* and *brisk ſpeck* of *Light*, as it does when *tenſe*, *round*, and *polite*, by its *Contraction* on the *contain'd Humours*, which then duely fill it.

12. *Faltring of the Tongue* is from the ſame *Relaxation*, as in *Drunken Perſons*.

13. *A Sopor* is from the *ſame Relaxation* over all the *ſenſile Parts of the Body*, by which Means *Senſe* and *Motion* are diminiſhed or loſt by the *Expanſion* of the *Animal Spirits*, which (as has been ſaid) being not duely compreſſed, become unfit for *both* at the ſame *time*.

14. *A ſlow and wide Pulſe* is from the ſame Cauſe, becauſe the ſaid *Relaxation* permits the Arteries to widen, and the *Animal Spirits* to expand, and conſequently renders the *motion* of the Heart *ſlow*, which is the cauſe of the *Pulſe*.

15. *A high Colour* or *Efflorescence of the Skin*, has been explain'd.

16. *Looſeneſs of the Jaw and Lips* is from the ſame *Relaxation*, (as was ſhewn;) and ſo is,

17. *Intumeſcence of the Lips*, (as has been ſhewn)

18. *Difficulty of Breathing* may be from *Two* different Cauſes; *either* by the *Relaxation* weakening the *requiſite Motions* for want of *Compreſſure* of the *Animal Spirits*, and by the *Flaccity* of the Parts themſelves; *Or*, by a great *Grievance* at *Stomach* upon the *Account* of the *Roſin* ſticking to it, and cauſing a *Convulſion* of thoſe Parts; both which may happen.

19. *Fury and Madneſs* may alſo happen, *either* by the exalted *Pleaſure* of its *Titillation*, as in *Drunkards*, who therefore ſcarce know what they do, the *Mind* being (as was ſaid) *alienated*; *Or* it may happen (as I have often known a kind of *Madneſs* to be produc'd) by a great *Grievance* at *Stomach*;

Stomach; which may well be from the *Rosin* grieving and teazing the *nicely sensile Stomach*; They may be easily distinguished, *one* (*viz.* that from the Rosin at *Stomach*) being with great *Distresses*, *Anxieties*, *Convulsions*, *&c.* and the *other* without any.

20. *Venereal Fury* proceeds from the high *Titillation* of the *Venereal Membranes* by the *Volatile Salt* of so much *Opium*, as if *Cantharides*, *Bees*, *&c.* were taken internally; but that these cannot so agreeably titillate those Parts as *Opium* does, whose *Volatile Particles* are render'd more pleasing by *oily ones*, and therefore much of the Nature of *Semen Virile*.

21. *Priapisms* are caused by the same continual *Titillation*.

22. *Violent Itchings of the Skin* are caused by the same tickling *Volatile Particles* in great Abundance, proportionable to the *excessive Dose*.

23. *Nauseas* are caused by the *Rosin* sticking at, and soliciting the *Stomach* to *Vomit*.

24. *Swimmings in the Head* are by *consent*, because the *Stomach* is grieved by that *Rosin*, as is observed in many Cases from a *grieved Stomach* upon a *Tendency* to *Vomit*, as when it is overloaden with *Wine*, or *indigestible Victuals*, or when Persons are *Sea*, or *Coach-sick*, *&c.* for it is not in these last *Cases*, because the *Brain* is offended (as People imagine) that they are *Sick*, or *Vomit*, but the *Swimming in the Head*, and *Offence* of the *Brain* happens, because the Stomach is offended by the Motion of the *Coach* or *Ship*, by Reason of its most *exquisite Sensation*, which the *Effluvia of a Cat*, *pestiferous Particles*, and *Commotions* caused by mear Passion, can, and do offend, (as was said) so as to cause *Vomitings*, *Anxieties*, *&c.* much more then may the Motion of a *Ship* or *Coach* do it. I shall not here enter into Contro-

verſie with thoſe that aſſert, That it is the *Head* is firſt offended in a Coach or Ship; it is ſufficient for my *Purpoſe*, that *Grievances at Stomach* do commonly cauſe *Swimmings in the Head*, for taking off thoſe *Grievances* cures them, as *Eating* when it is from the *Grievance* of *Hunger* or *Wind at Stomach*, and diſcharging the *Stomach* of a great Load of Wine, Ale, or indigeſtible Matters, when ſuch Things cauſe it, do cure ſuch *Swimmings in the Head.*

The *Way* how *Grievances* at *Stomach* do cauſe thoſe *Swimmings*, is by cauſing a *Contraction* (as all *Grievances* do, but eſpecially thoſe at *Stomach*) of the *Membranes* of the *Brain*, as it does of all other, but mainly of theſe, becauſe very ſenſile; by which means the *Animal Spirits* being compreſſed, grow more *irrequiete* and skipping up and down, and the *Compreſſion* not being continually alike in general, or the *Arteries* affording an uneven and forcible ſupply of them (or *Fumes*) from the Bloud by the *Compreſſion*, nor affecting all Parts of the *Brain* with equal *Force*, becauſe the Pleaſure endeavour to relax, *&c.* there muſt thence ariſe *Eddies*, *Vortices*, or *Whirls* thereof, which cauſe *Swimmings*, *Vertigo's*, *&c.* according as they happen to be moved.

That they happen from ſuch *Contraction* is manifeſt;

1. Becauſe the *Grievance* at *Stomach* can add nothing elſe to the *Brain*, or its *Membranes*. 2. Becauſe they are taken off by pleaſing the *Stomach*, and conſequently by *Relaxation*, as by a *Glaſs of Wine*, *Victuals*, an *Opiate* that is not reſinous, *&c.*

It

It is here well worth your *notice*, That all *consent of Parts* (a Thing much admir'd) is only by *Contraction* or *Relaxation*, which suddenly affect the whole Systeme of the *Nerves* and *Membranes*.

25. *Vertigo's* are from the same Cause.

26. *Vomitings* are caused (as was said) by the great *Grievance* of the *acrimonious Rosin* sticking to the Coat of the *Stomach*.

27. *Hiccoughs* are from the same Cause, which happen upon the decay of Power vigorously to Vomit, dwindling into those fruitless *Convulsive subsultory Jerks*, or Half *Endeavours*.

28. *Distresses and Anxieties* must necessarily attend such a *grievous Sensation* and Defection of *Nature's Endeavour*, as being overborn and disabled to work for it self.

29. *A turbulent Pulse* must be an Effect of the foregoing Tumults.

30. *Convulsions* happen (as was shewn) by the enormous *Compression* of the *Animal Spirits*, by Reason of the *violent Contraction* upon the great *Grievance* by the *Rosin* at *Stomach*, which causes them to skip and fling up and down very forcibly under the squeese of the *Compression*, and possibly skirmishing under the Vicissitudes of it and *Relaxation*.

31. *Faintings and Leipothymies* are caused (as has been explain'd) by the sensitive Soul's being over-tired by the Fatigue of *Defensive Contraction*, and yielding himself to Rest from all *Contraction*, as the last Relief, *&c.* whereupon *Sense* and *Motion* do fail for want of *Compression* to render the Spirits springy, active, and fit for the *Purpose*.

32. *Cold Breath* is but a necessary Consequence of the Loss of Motion, and therefore of *Heat*, by such *Leipothymies* and *Faintings*.

33. *Death* is cauſed Two manner of Ways, that is, *either* by an utter *Expenſe of Spirits*, and thereupon a *Derelict*ion (or *Extinct*ion) of the *ſenſitive Soul* by reaſon of thoſe *Diſtreſſes* and *Fatigues* upon the Account of the *invincible Roſin*; *Or* by too much *Relaxation* diſabling all the *motions* of the *Body*, as in ſuch as dye being *dead Drunk*, which looking not unlike an *Apoplexy*, makes *Authors* ſay, that *Opium* cauſes *Apoplexies*.

Such as eſcape *Death*, do ſo generally by

34. *Plentiful Purging*, which is occaſioned by a *great Quantity* of the *Roſin* of *Opium* meeting a ſtrong *Digeſtion* and fixed Salts (as has been ſaid.)

35. *Sweats that ſmell of the Opium* are cauſed, 1. By the Openneſs of the *Pores* by *Relaxation*. 2. By Plenty, or at leaſt ſufficiency of Moiſture for that End; for otherwiſe (as was ſhewn) it would be only *inſenſible Perſpiration*. 3. By the great Quantity of *Volatile Salt* attenuating the Humours. 4. By the ſtrict, intimate, and even indiſſoluble *ſpecifick Union* or *Combination* of the *Volatile Salt* and *Oily Parts*, which makes it hold its *ſpecifick Smell* to the laſt.

36. *Violent Itchings in the Skin* muſt of neceſſity follow a great *Quantity of Opium*, ſince it cauſes ſuch *Itchings* (as was ſhewn) in a *ſmall Quantity* by the *Titillation* of its *Volatile Salt*.

Note, That theſe *Effects* do not all happen to all Men that take it in an *exceſſive Doſe*, but ſome to one, and ſome to others, (as was intimated in *Chap.* 5.) according as they are more or leſs troubled with the *Roſin*, *Quantity*, *Relaxation*, *&c.*

CHAP.

CHAP. XXII.

The Explication of the Effects of a long and laviſh Uſe of Opium.

AS an *Exceſſive Doſe* of *Opium* is *Intemperance* for *one time*, ſo a *long and laviſh Uſe of it* is an *habitual Intemperance* for a long *time*; therefore if you could not rationally expect *good Effects* in that Caſe, any more than from the *beſt Wine* taken ſuddenly in a vaſt *Quantity*, it follows, that you cannot expect *good Effects* from an *habitual Intemperate Taking* of it, any more than from a *long and laviſh Drinking of Wine*, tho' both are excellently good in their *Kind*, (but that the *Opium* has the pernicious reſinous Part join'd with it;) There is nothing ſo good, whereof an *intemperate Uſe* is not *miſchievous*, *God* having ſo ordered it to deter from, and puniſh *Intemperance*, and the *Abuſe* of his *Creatures*; Therefore ill *Effects* are not always to be imputed to the *viciouſneſs* of the Things uſed, but frequently of the *Perſon* that imprudently uſes them.

1. *Relaxation and Debility of all Parts* is contracted by the habitual over-relaxing thereof by the *laviſh Uſe of Opium.*

2. *An Inhability of doing any Thing without it* is contracted by the *habitual Pleaſure*, *Comfort*, *Promptitude*, and *Euphory* it cauſes when taken, without which the *ſenſitive Soul* becomes lazy, liſtleſs, and averſe to all *Actions*; it is as if a Man, uſed to Dance to Excellent *Muſick*, were required to do it without any *Muſick* at all, nor as much as *Thoughts* of it, or mumbling it within

himſelf; *Or* that one who Drinks nothing but *Wine*, and Eats the beſt, ſhould be ſuddenly denied both, and forced to live upon *Bread* and *Water*; Or, that ſuch as always take *Tobacco* at their *Studies*, ſhould be ſuddenly debarr'd thereof, and required to Study without it; How very liſtleſs would a Man be in ſuch Caſes? Tho' hardly any of the *Compariſons* come up to that of *Opium*, becauſe of the *charming Pleaſure, mighty Euphory* and *Promptitude* that it cauſes; it is as if one were ſupported, and wholly depended upon *Cordials*, and ſuddenly denied them, *&c.*

5. *An Inhability of getting up in the morning till it is taken, and begins to operate*, proceeds from the ſame Cauſe. A *Mechanical Reaſon* may be expected here alſo as to theſe Matters, but it will hardly bear it, any more than how the *Will* or *Appetite* cauſes the firſt *Impulſe* toward *voluntary Motion*; all that can be ſaid is, that without the *Opium* the *ſenſitive Soul* is, when he does any Thing, to act under the *Toil* and *Difficulties* of a full *vigilative Contraction*, (as being awake) *intentive Contraction*, (as acting) and *defenſive Contraction*, (as being grieved) when the *Operation of Opium* is over, (as after *Venereal Pleaſure, &c.*) ſo that now he labours under the great *Diſadvantages* and *Drudgery* of all the *Three Contractions*, whereas by the *Pleaſure, fine Titillation* of *Opium*, and *Relaxation* conſequential thereunto, he was eaſed of all the *Defenſive Contraction*, which is the moſt grievous, and in great meaſure of the *Vigilative*, (as has been ſhewn) which makes *Working, Journeying, &c.* very eaſie to him; Therefore it is as if one that delights in *Muſick*, Danced to Charming Melody in beloved Company, with pleaſing *Refections* of *Wine, &c.* and in the *other Caſe*, as if one *laboured* in *Grief* or *Pain*. Now ſuppoſe that one, uſed never to Act or Work without ſuch

mighty

mighty *Pleaſant Advantages*, and Cauſes of *Euphory*, were required to *act* under the *Preſſure* of the *Three Contractions*, (or in *Grief* or *Pain*) how liſtleſs would he be to Act, Work, get up, *&c.*

4. *A dull, moapiſh, and heavy Diſpoſition*, muſt be the Effect, unleſs it be while they *pleaſe*, *comfort*, and *enliven themſelves* by the *Opium*, becauſe their *Brain* is habitually over relaxed; which is the very Caſe of old *Drunkards*, who have (as 'tis ſaid) drank away their *Parts* by ſuch an *habitual Relaxation* of the *Brain*, (which over-much *Sleeping* cauſes alſo upon the Account of the like *Relaxation*) therefore they muſt be moapiſh till the pleaſing *Titillation* of *Opium* enlivens them.

5. *Diminution of Appetite* is cauſed by an *habitual Relaxation* of the *Stomach*, taking away its *Senſation*, and ſuſpending the *Menſtruum* from flowing to it as freely as it ſhould, and would, if there were a due *Contraction* to ſqueeſe it out.

6. *Weakneſs of Digeſtion* happens from the ſame Cauſes.

7. *Dropſies* are cauſed by the *Relaxation* weakning the Parts, and making them thereby *ſuſceptible* of Humours; as alſo by *Diminution* of *Appetite* and *Digeſtion*, (as in old *Drunkards.*)

8. *Decay of Parts* (or *Wit*) happens from habitual *Relaxation of the Brain*, and its *Membranes*, (as in old *Drunkards.*)

9. *Weakneſs of Memory* proceeds from the ſame Cauſe (as in old *Drunkards.*)

10. *Stooping in the Back* is cauſed by the *habitual Relaxation* of the Parts, which weakens and cauſes them to comply with our *Tendency* and *Uſe* of bending forward, and yield to the greater Weight, that is (generally ſpeaking) on the foreſide of the *Back-bone* (or *Perpendicular*;) ſo that Stooping muſt gradually follow thoſe conſpiring Cauſes, as it does in *habitual Drunkards*, whoſe Parts are relax'd.

11. *Early Decrepiteneſs* muſt proceed from the aforelaid *Relaxation* ſpoiling the Tone of Parts, and cauſing *Want* of *Appetite*, *Digeſtion*, *&c.* (in the manner before ſhewn.)

12. *Shortneſs of Life* muſt be the *Effect* of the ſame Cauſes.

13. *Acrimony of Blood* proceeds from the Abundance of *Acrimonious Volatile Salts* taken in the *Opium*, wherein it is much more acrimonious than our natural *Volatile Salt*, and in greater *Quantity* proportionably; Therefore it can be no Wonder, that,

14. It *excites Inclination to Venery* by that acrimonious *Salt*, which is *analogous* to that of *Cantharides*, *Ants*, *Bees*, *&c.*

15. *Frequent Inclinations to make Water* is alſo a know and common Effect of ſuch a *Salt*, by its irritating and ſoliciting the *Bladder*, *&c.*

16. *Priapiſms and frequent Erections* are, and muſt be from the ſame Cauſe.

17. *Nocturnal Pollutions* are neceſſary Conſequences of the *Relaxation* and the *Titillation* cauſed by thoſe *Volatile Salts*, (as was ſaid.)

CHAP.

CHAP. XXIII.

The Explication of the Effects of Leaving off Opium, *after a long and laviſh Uſe thereof.*

I. *Great, and even intolerable Diſtreſſes, Anxieties, and Depreſſions of Spirits,* do happen; 1. Becauſe the *ſenſitive Soul,* who is ſo much comforted, diverted, and ſupported by the habitual and dearly beloved *Pleaſure* that *Opium* cauſes, being ſuddenly deprived thereof, (by which it was mainly ſuſtain'd) is exceedingly diſappointed and caſt down. 2. Becauſe he now labours under the ſore Burthen of the Three *Contractions,* ſo that every Thing ſeems, and is really more grievous to him; for now it acts as one in *Pain* or *Grief,* and every Thing affects him more ſmartly proportionable to the *Compreſſion* cauſed thereby of the *Animal Spirits,* unleſs he returns to the Pleaſure of *Opium,* which elevates it again; Or uſes *generous Wine,* as its *ſubſtitute,* tho' it does not equal it, either in the *Intenſeneſs* or *Duration* of the *Pleaſure,* unleſs repeated (as I have ſome where directed) once in Half an Hour, or an Hour, in a moderate manner, which cauſes a *continuance* of the *Pleaſure,* tho' it cannot equal the *Intenſeneſs* of that of *Opium,* which therefore has the *greater Effects.*

II. *A Return of all Diſeaſes, Pains,* and *Diſaſters,* muſt happen generally, becauſe the *Opium* takes them off by a bare *Diverſion* of the Senſe thereof by *Pleaſure.*

III. *Dangerous Looſeneſſes* happen ſometimes, becauſe the *Senſation* grows more grievous; for, as the *pleaſant Senſation* cauſed by *Opium,* takes away

way the *Perception* of the Irritation of Humours, ſo the *Grievance* of Loſing that *Pleaſure* cauſing *Contraction*, makes all *Senſation* ſmarter, and conſequently more irritating, ſo that the *Humours* have thereby more of the Effect of *Purgers*, which operate (as all agree) by *Irritation*; Beſides, that the *Humours* before detain'd and ſuſpended by *Relaxation*, (as in *Sleep*) are now therefore pour'd down in greater *Quantity* by the advanced *Contraction* ſqueeſing them out, as the *Return* of the *Vigilative Contraction* after *Sleep*, cauſes Men to be more apt to go to Stool upon awaking, or getting up in the *morning*; which may be well compared (in ſome meaſure) to Purging, after Leaving off the Uſe of *Opium*, ſince it relaxes as *Sleep* does, and that for a much longer *Time* by a continued Uſe thereof.

IV. *Death commonly follows*, for all the Reaſons aforeſaid, eſpecially the great and *intolerable Diſtreſſes* of Soul that they are under, unleſs *Opium* be uſed, which ſoon ſets them right, or *Wine* (its *Subſtitute*) ſo frequently uſed, as to continue its *Cordial Pleaſure* at *Stomach*.

Nothing now remains but to take a ſhort *Review*, to ſee whether I have explain'd all the *amazing Contradictions* that ſeem to be in the *Effects* of *Opium*; for tho' it is really done, yet may it not ſo well appear as when ſet one againſt the other. It would be *Tautology* to repeat all the *Reaſons*, therefore I ſhall only mention them in the cloſe *Order* I at firſt enumerated them, that you may ſee that they are all explicated in the former *Diſcourſe*.

You may well remember, that I have ſhewn;

1. How it cauſes *Sleeping* and *Watching* (in divers Perſons.) 2. How

2. How it *cauſes* and *prevents Sweat.*

3. How it *relaxes* and *ſtops Looſeneſſes* (even by *relaxing.*)

4. How it *ſtops Fluxes*, and *promotes Sweat* and *Perſpiration.*

5. How it *ſtupifies the Senſe of Feeling*, yet *irritates it.*

6. How it *cauſes Stupidity*, (if you ſit or lie ſtill) otherwiſe *Promptitude in Buſineſs.*

7. How it *cauſes Cloudineſs* and *Serenity*; *That*, if one lies ſtill and dozes; *This*, if he keeps in *Action*; *That*, by an *exceſſive* and *laviſh Uſe* thereof, which cauſes *Moapiſhneſs*; *This*, by a temperate occaſional taking thereof, eſpecially in the *Morning*, upon *Journeys*, *&c.*

8. How it *excites the Spirits, yet quiets and compoſes them in Hyſterick Fits, Diary Fevers*, from *Pain, Commotions, &c.*

9. How that it is *very hot*, and *takes off Fevers.*

10. How tho' it is *hot and bitter, yet it leſſens Appetite and Hunger*, which is a *grievous Senſation*, by cauſing a *pleaſant one.*

11. How it ſometimes ſtops Urine, by relaxing the *Bladder*, *ſuſpending Humours*, *&c.* and promotes it by its tickling *Volatile Salt*, as *Cantharides*, *Bees*, *Ants*, *&c.* do.

12. How it *relaxes, and thereby weakens*, as in *Sleep*, *&c. yet enables to perform Labour*, *Journeys*, *&c.* with great *Euphory*, by *divertive Pleaſure.*

13. How it *cauſes* and *prevents Abortion*; *That*, by *over-relaxing*; *This*, by *allaying Pains*, *Terrours*, *&c.* that might cauſe it.

14. How it *ſtops Vomiting* by taking off *Irritations*, *&c.* and *cauſes it* by the *Adherence* of its *indigeſtible* and *viſcid Roſin.*

15. How it *ſtops Purging*, and *ſometimes cauſes it* by the *Diſſolution* of its Roſin by a ſtrong *Digeſtion*,

geſtion, fixed Salts, *&c.* when its Quantity is conſiderable; which makes it happen but rarely.

16. How tho' *acrimonious*, *it takes away the ſenſe of Acrimony.*

17. How it *cauſes Madneſs*, and *cures it* by compoſing the Spirits, *&c.*

18. How it *cauſes Palſies* by relaxing the Parts, and making them ſuſceptible of Humours, cauſing ill *Digeſtion*, *&c.* And *may cure them* (as Dr. *Willis* gives an *Inſtance*) by opening the *Pores.*

19. How it *cauſes Palſies*, and cures *Stupors*, *&c.* that proceed from *Cold* and *Contracting Cauſes.*

20. How it *cauſes Dryneſs in the Mouth*, yet (by taking off *Fevers*) often *cures it.*

21. How it *takes off Hiccoughs*, and *cauſes them*, as it does *Vomiting*, and for the ſame Cauſes.

22. How it *ſtanches Bloud* by quieting its motion, yet promotes the *Menſes* and *Lochia* by relaxing, opening, and widening the Veſſels and Pores.

23. How it *ſtops critical motions*, that depend upon *Irritation* and *Contraction*, and *promotes ſuch* as depend upon *opening the Pores.*

24. How *it revives People that are at the Point of Death* for want of *Opium*, or by *violent Contractions* and *Convulſions*, and is *fatal to other weak Perſons.*

25. How it *cauſes Convulſions* by its *grieving Roſin*, and *cures them* by quieting and compoſing the Spirits by pleaſing them.

26. How it *cauſes Contraction* by the *grievous Senſation* that its *Roſin* cauſes, and *Relaxation* by the *pleaſant Senſation* that its *Sal-Volatile-Oleoſum* cauſes; by *That it cauſes* many ill *Effects*, not here named, and by *This it cures* them; for how can ſuch *contrary Cauſes* (according as one or the other prevails) not cauſe *contrary*, and ſeemingly *contradictory* Effects at *divers Times*, and in *divers Perſons.*

27. How

27. How it *relaxes*, yet *cauſes the Tenſion, Rigidity, and Erection of the Penis, Priapiſms, &c.* by its *Titillation.*

Thus have you all, even the moſt myſterious and *ſeemingly Contradictory Effects* of *Opium*, explain'd and reconcil'd, and that ſo eaſily, that if there were no other *Proof* of the *Truth* of my *Foundation*, it is ſufficient to convince any Man of its *Validity*, conſidering the *Vaſtneſs* of the *Number*, and *Perplexity* of the *Nature* of thoſe *Effects*, that are all with ſuch *Facility* explain'd, is able even to diſparage the *Performance* as *mean* and *obvious*, (like that of the *Circulation of the Bloud*, or *America* when found out) did not the *newneſs* of the Thing, the baffled *Endeavours* of all Mankind, and the ſeeming Impoſſibility of ever finding it out, (which was almoſt agreed upon) ſpeak in its *behalf*. Conſider, that nothing can be *plain* and *eaſie*, but what is *true*, and conſequently nothing valuable but what is ſo; what's true Knowledge, but *the Knowledge of Things as they really are?* And when a Thing is known as really as it is, it muſt be plain, and never ſo till then; for to take a Thing to be what it is not, is all *Darkneſs*, *Errour*, *Puzzle*, *Confuſion*, and *Vanity*, as all Diſcourſes of *Opium* have hitherto been.

It is no *Wonder* then, that the *Cauſe of the Operation of Opium* grew more and more obſcure, while they ſtated *the Cold Quality of very hot Opium, the Belching up of Vulcano's of Fumes from the Stomach to the Head*, (which have no Exiſtence) *their acting as a Poiſon of the Animal Spirits, their fixing and coagulating them, their clogging them by Adherence, or clouding them, their wedging themſelves among the Animal Spirits*, (none knows how) *and thereby diſabling them, their ſtuffing the Pores of the Brain,*

Brain, or compreſſing it, and thereby hindering the Generation of Animal Spirits, to be the *Cauſes of the Noble and Pleaſant Operation of Opium*, without any *Foundation* in *Nature*, or the leaſt *Evidence* of *Senſe* or *Reaſon*, but vain *Phantaſtical Imaginations* form'd in the *Chimera-Forges* of their *Wanton Brains*, while they endeavour'd (*Right* or *Wrong*) to appear conſiderable *Folks*, by doing nothing to the *Purpoſe* in a kind of pretty, plauſible, and impoſing manner, thereby ſtuffing the unwary *World* with wrong and vain Conceptions and impertinent *Prejudices*, which are the greateſt *Obſtacles* of *Knowledge*.

I would fain know, which of thoſe *Hypotheſiſes* can tollerably ſolve 1 in 10 of the *Phenomena's* that I have enumerated, or, indeed, any one *Phenomenon truly, mechanically*, and *demonſtratively*; yet are thoſe *Whims* the *glorious Productions* of Thouſands of years Studies, and ſolicitous *Diſquiſitions*; tho' every one that took *Opium*, actually felt the true Cauſe of its Operation, *viz.* The *pleaſing Delight that it occaſioned, by affecting the Membranes and Animal Spirits*, after the manner that I have at large ſet forth.

Good God! what blund'ring Groper is Mankind?
Who daily felt the Cauſe it ne're could find!
Tho' Thouſands ſought it with an eager Mind.

CHAP.

CHAP. XXIV.

Of Opium *ſeparated from its noxious Part, (or Roſin) and whether it is a* Panacea, *&c.*

THus far have I ſpoken of Crude *Opium* jointly with its *Roſin* or *noxious Part*, now I will conſider it ſeparated from it, and ſhew how to do it. *Galen* ſays, That it is very difficult to find an *excellent Remedy* without a *noxious Quality*.

And it is as difficult to find any Thing ſo *noxious*, as not to afford a *good Medicament*; which you ſee in *Vipers*, *Scorpions*, *Mercury*, *&c.*

All, or moſt *Phyſicians*, unanimouſly agree, That *Opium* has ſuch a *noxious Quality*, that cauſes *Vomitings*, *Hiccoughs*, *Diſtreſſes*, *Anxieties*, *Convulſions*, chiefly at or about the *Region* of the *Stomach*; and that if it were freed from it, it would be the *nobleſt of Medicaments*: Who can otherwiſe imagine? ſeeing it is ſo excellent and univerſal a *Remedy*, as it is now uſed in the *World*, without ſuch an excellent *Preparation* thereof, wherein the *noxious Principle* is ſeparated from it.

Of which *Paracelſus* ſays, That whoever ſhall enjoy it, will be a Profeſſor of no leſs Knowledge than *Apollo*, *Machaon*, or *Podalyrius*, tho' he was the greateſt Maſter of *Arcanas*, *Panaceas*, *&c.* yet does he *confeſs*, "*That a Preparation of* Opium *ſtood* "*him in ſtead, and perform'd his Buſineſs, when* "*all his great Medicaments fail'd him; and that it* "*will diſſolve Diſeaſes, as Fire does Snow*; or uſes Words to the ſame *Effect*. *Helmont*

Helmont, being in a kind of *Rapture*, upon Conſideration of its Excellency, burſts out into this *Exclamation*; *Happy is the Sick Man whoſe Phyſician knows how to ſeparate the deadly (or noxious) Part from* Opium!

Platerus affirm'd, *That he could with a Preparation of* Opium *preſerve the broken Wheel of Life.*

Etmuller ſays, *That* Opium *may deſervedly be eſteem'd a general Remedy*; and the main *End* of his *Tract*, *De parvis Morborum Initiis*, is to ſhew how *Volatiles*, more eſpecially *Salia-Volatilia-Oleoſa*, (as that of *Opium*) may in ſmall Quantities alter us, and cure our *Diſeaſes.*

It were endleſs to tell you the *Eulogies* of the Learned concerning ſuch a *Preparation* of *Opium*, which they generall conclude to be a moſt noble *Panacea*; therefore many, and very ſolicitous have been the *Diſquiſitions* of the Ingenious and Induſtrious, to find out this *heroick*, *generous*, and *moſt glorious Medicament*. I am fully ſatisfied, that the pure *Sal-Volatile-Oleoſum of Opium*, duely ſeparated from its *noxious Roſin*, *Droſs*, *&c.* is the very Thing; ſome of the Reaſons that convince me are as followeth, *viz.*

1. Becauſe *Opium* has no other *Principle* in it, that ſignifies any Thing as to its laudable and noble *Effects*, but its *Sal Volatile Oleoſum* (as has been ſhewn.)

2. Becauſe the *Sal-Volatile-Oleoſum* of *Opium* produces all its *good Effects.*

3. Becauſe the *Sal-Volatile-Oleoſum* duely ſeparated from its *Roſin*, and other Principles, produces no ill *Effect* in a moderate *Doſe.*

This

This added to what has been Diſcourſed at large of the *Principles of Opium*, is (I think) ſufficient to ſatisfie any Man, that the *Sal-Volatile-Oleoſum of Opium* (ſo ſeparated) is the great *Panacea* that is ſought for.

However, becauſe we are upon the *greateſt Thing* in *Phyſick*, (as may be well inferr'd from what has been already ſaid) and that the *World* has been under great *Fears*, *Jealouſies*, and *Blindneſs*, concerning this *Matter*, and the *Uſe* of *Opium*; it will be well worth our While to give all imaginable *Satisfaction* in this Caſe, therefore I will,

Firſt, Lay down all the requiſite *Qualifications* of a *Compleat Panacea*, as far as I can collect out of the moſt Eminent *Authors*, and my own Conſideration thereof.

Secondly, I will particularly enquire as to each of the *Qualifications*, whether the *Sal Volatile-Oleoſum* of *Opium*, duely ſeparated from every other *Principle* of *Opium*, is furniſhed therewith?

Thirdly, I will ſhew you how duely to ſeparate its *Droſs*, *Roſin*, *&c.* ſo as to leave a pure, ſincere *Sal-Volatile-Oleoſum* of *Opium* for *Uſe*.

The requiſite Qualifications of a Panacea *are theſe*, viz.

1. *That it ſhould highly pleaſe our Senſation at Stomach*; becauſe the *Stomach* is contrived and appointed by *God* and *Nature*, as the *Touchſtone* to try, a *Sentinel* truely to inform, and a *Critical Judge* to determine, what is, or is not agreeable to our *Nature* in general, and therefore (as has been ſhewn) endued with a wonderful *ſagacity* and *nicety of Senſation* for that *End*. It follows

then, that a *Panacea* ſhould be very pleaſing and agreeable to the *Stomach*, and therefore very *cordial*.

2. *That it ſhould be highly pleaſing to the ſenſitive Soul*, which is the *Principle of all Motion, Action*, and *Alteration* in an *Animal*; This *Helmont* couches under the Name of pleaſing the *Archæus*.

3. *That it ſhould take away all Grievances of the ſenſitive Soul* (or *Archæus*) becauſe its *Grievance* is the *Eſſential Form* of *Diſeaſes*, for even Morbid *Matter*, unleſs it cauſes a *Grievance*, cauſes no more *Diſeaſe* than it does in a dead Carcaſs, as *Helmont* and *common Reaſon* aſſures us; therefore *Diſeaſe* and *Grievance* are only Two Words ſignifying the ſame Thing, and nothing is capable of *Grievance* in an *Animal*, as ſuch, but the *ſenſitive Soul*.

4. *It ſhould compoſe, comfort, enliven, encourage, and invigorate our ſenſitive Soul and Spirits*, as being the *Principles* of *Motion* in our *Animal Nature*, in order to ſelf Preſervation; for *Nature* (or thoſe *active Principles* within us) is the *Curer* of *Diſeaſes*, and we *Phyſicians* only its Miniſters to offer it good Means, *&c.*

5. *The Principles of a* Panacea *ſhould be agreeable to the beſt, nobleſt, moſt active, and predominant Principles of our Bodies.*

6. *Thoſe Principles in the* Panacea *ſhould be more vigorous than ours*, to reduce them, when deficient, and exalt them, when depreſſed, clog'd, *&c.*

7. *It ſhould be a general Reſolver of Humours*, for which Cauſe the *Liquor Alcabeſt* is ſo much extolled for a *Panacea*. Hear what the great Phyſician *Claudius de la Courvee* ſays, *Uni morboſæ, & ſemper preter Naturam humorum coagulationi, unique eorumdem colliquationi, cui perpetuo intendit natura, diligenter ſtudeas; hujus adjuvandæ, illius corrigendæ modum ſi aſſecutus fueris, habebis in Praxi ſecretum*

omni

omni auro potabili, omnique Antidoto præstantius; denique plus poteris in Praxi, quam si cursus Astrorum, Metallorum vires, aut totam callueris panaceam.

8. *It should, after such Resolution of Humours, compose, concentrate, combine, and unite the good Principles.*

9. *It should discuss the bad and useless Parts.*

10. *It should open the Pores to give them their Exit,* by that most universal, natural, plentiful, kindly, and easie *Evacuation.*

11. *That* (after all) *it should (like the Liquor Alcahest)* remain very much unaltered in it self.

Now whatsoever is endued with these Eleven most noble *Qualifications*, must be in the Estimation of any *Rational Physician* or *Philosopher*, *a glorious Panacea*, that is fitted to take off the *Matter* and *Form* of all *Diseases*, (or *Grievances*) as far as it is in the *Power* of a *Natural Medicament* (or *Alterative*) so to do; Therefore, let us see, how the pure *Sal Volatile-Oleosum* of *Opium* is furnished therewith?

1. *It is so highly agreeable and pleasing to our most nice Sensation at Stomach*, which is given us for a *Touchstone*, *Watch*, and *Judge* of what is agreeable and beneficial to our *Bodies*, that nothing in the whole World is so agreeable and pleasing to it, and therefore nothing is more agreeable and beneficial to our *Animal Nature*; it would imply a *Contradiction*, that the *Stomach*, which is given us (and accordingly qualfied) to make a true *Report* of what is, or is not agreeable and beneficial to us, should always (tho' it may by *Accident* possibly) give us a *false Report* of the *Agreeableness* of Things; It would be more than *Prophaneness* to attribute such deceitful, unkind, and unwise *Contrivances* to the infinitely *Good* and *Wise*; therefore

the *Stomach* does infallibly teſtify, and aſſure us, that it is moſt agreeable to our *Nature*, ſeeing it is always ſo to it; *Agreeableneſs* and *Diſagreeableneſs*, with which, is appointed and ordain'd by *God* and *Nature* to be the *Teſt* and *Touchſtone* of what is agreeable or otherwiſe to our *Animal Nature*.

Obj. Why then, being ſo agreeable to the *Stomach*, ſhould it not create an *Appetite*, but rather leſſen it?

Anſ. Tho' ſome may be ſo weak as to make ſuch an *Objection*, becauſe Things agreeable to the *Stomach* are commonly reputed to cauſe an *Appetite*, yet (the Matter duely conſidered) the Caſe is quite contrary; for *Appetite* (or *Hunger*) is a *grievous Senſation* at *Stomach*, which cannot be expected from Things that gratifie and pleaſe the *Stomach*, which are the adequate Cure of a *grievous Senſation* (or *Hunger*;) Thus *Meat* and *Drink* (as has been ſhewn) cure an *Appetite*, grievous Senſation, or Hunger; Thus *Wine* and *Opium* do (by pleaſing the *Stomach*) cure a *canine Appetite*, *&c.* Therefore you may *Note* by the by, that all *Meat* and *Drink* that pleaſe the *Stomach*, and gratifie its *Senſe*, are really *Opiates* in ſome *degree*, cauſing good Humour, Sleepineſs, *&c.*

Appetite or *Hunger*, tho' it is a convenient *Call* or *Intimation* of *Want* of *Supply* and *Recruit*, is, as ſuch, a conſequent of *defect*, and ſo unnatural, tho' call'd *Natural*, becauſe it is a Thing that happens of courſe, to direct us how to proportion Things to the *Exigence* of *Nature*; of which there would be no need, if we could otherwiſe proportion good and agreeable *Refection* to our *Wants* thereof: In ſhort, it is a *Diſeaſe* which

Thing

Things agreeable and pleasing to the *Stomach*, as our *Panacea*, must cure, or else it would not be a *Panacea*; and (as was shewn) nothing can be a more proper Cure of *Grievance* (or *Displeasure*) than *Pleasure*; Therefore what is agreeable to our *Stomach*, and consequently to our *Body*, must cure not cause *Appetite*, as *Meat* and *Drink*, *&c.*

Obj. But it may be said, That *Appetite* argues a good *Digestion*, which is good for the *Body*.

Ans. It does indeed argue a quick *Digestion*, and great Expence of the *Recruits* taken in, but still it is all bottom'd upon *Deficiency*; and *Digestion* may be, and is very often too quick, as in the *Boulimia*, (or *canine Appetite*) Nature delights in a gentle, kind, and gradual *Dissolution* of the *Meat* at *Stomach*; to which you'll find, by and by, that *Opium* very much conduces by its *resolving Quality*.

2. *Nothing in Nature is more pleasing to the sensitive Soul*, as appears by the whole Series of our Discourse, and the explaining all the *Phenomena* or *good Effects* of *Opium* by that very *Pleasure* of the *sensitive Soul*. Therefore,

3. *It* (as was manifestly shewn) *does thereby take off all Grievances*, which are the *essential Forms* of *Diseases*; and the *essential Forms* of *Diseases* being taken away, (*which give them being, and make them to be what they are*, according to the *Definition* of an *essential Form*) the very being of *Diseases* must be taken away: Therefore our *Sal-Volatile-Oleosum* is a *compleat Panacea*, that takes away the *Essence* or Being of *Diseases*, in taking away the *Grievance* thereof.

Here it may be ſaid, that the Matter of the Diſtemper remains, and conſequently a *Diſpoſition* to a *Relapſe* as ſoon as the *Sal-Volatile-Oleoſum* has ended its Operation.

But what need it end at all, if you pleaſe? It may be renewed without *Danger* (for this is not as *reſinous Opium*) till the Matter is ſubdued thereby, which it will alſo do, as appears more manifeſtly by the following *Qualifications*. For (as has been ſhewn)

4. *It compoſes, comforts, enlivens, encourages, invigorates, and cauſes a great Euphory of the ſenſitive Soul and Spirits*, which are our *Natural active Principles* of Motion, by which all ill *Matter* is effectively ſubdued when they act with *Alacrity* and *Vigour*, they being the *Principal Agents*, and we *Phyſicians* but (as was ſaid) *Miniſters*, or as *Handmaids*, to offer or hand *good Matter*, *Medicaments*, or *Inſtruments*, to thoſe *Principal Agents* of *Nature*; and that this *Sal-Volatile-Oleoſum* of *Opium* is the moſt proper *Matter* or *Medicament* we can put into *Nature's* Hands ſo invigorated, appears manifeſtly in that,

5. *Its Principles are the moſt agreeable to the beſt, nobleſt, moſt active, and predominant Principles of our Bodies*, as has been proved moſt evidently *plene & plane*, nor is it only agreeable, but,

6. *More vigorous and powerful to actuate, reduce, alter, or exalt our Principles*, according to the Direction of our invigorated *Nature*, (or ſenſitive *Soul* and *Spirits*) which having ſo convenient an Inſtrument, and highly qualified a Matter, will ſoon alter the perverſe, renew the decaid, acuate the dull, and elevate the depreſſed, effete, and pall'd Humours of our Bodies, eſpecially ſeeing,

7. *That*

7. *That the* Sal-Volatile-Oleosum *of* Opium *being so agreeable and powerful, must be the greatest Resolver of Humours that can be imagined*; for all *Resolution* is by an Agreement of Particles, which makes them easily miscible, insinuate into, and penetrate each other, especially if one be somewhat more vigorous and penetrating than the other, as the *Sal-Volatile-Oleosum* has been plainly proved to be; Thus it is, that all *Menstruums* do so resolve things of their own Nature, and so purifie and cleanse them, by taking to themselves what is meerly and purely of the same *Nature*, and rejecting or letting go their Hold of what is otherwise: Where it is worth noting, how upon the Account of the intimate Combination and Union of the *Volatile Salt* and *Oily Parts* in our *Panacea*, it is dissolvable in all *Menstruums*, and consequently an *universal Resolvent* of all the *Humours* of our Bodies, which its *external resolving* of all *Humours* and *Tumours* does also prove. Now if it be such a *Resolver*, of which there is no Place to doubt, then as *Claudius de la Courvee* says, it must excell all Things in altering and reducing all the Humours of our Bodies to a good and agreeable Condition. Nor does it only thus resolve them, and thereby separate (as was said) the good from the bad, but,

8. (When it has so done) *it, by the amicable Agreeableness of its* Sal-Volatile-Oleosum, *composing Faculty, strict Combination of its Principles, joins to, concentrates, congregates, and* (as it were) *cements the best and most agreeable into a close Union and firm Texture*, by (as was said) the Direction of *invigorated Nature*, which is of it self (the good being once separated from the bad) highly sufficient (without any other Help) to unite Parts so agreeable, and of themselves inclined to unite and combine, tho' all the Parts of *Opium* (like those of

the great *Dissolvent*) were gone; and when that is done,

9. *The high discussive Quality of the* Sal-Volatile-Oleosum *must be very effectual for the Diffiation and Discussion of the sever'd effete Particles*, which must be highly assisted and improved by the brisk and chearful Motions of *Nature*, (*viz.* the *sensitive Soul* and *Spirits*) so (as is aforesaid) invigorated; Nor is this all, but to compleat and perfect the Operation,

10. *It lays open all the Pores of the Body* (as has been Demonstrated) to let them out, and give the ill Particles their *final Exit*, by the most *natural* and *plentiful Way* of *Evacuation*, leaving the Body free from all *Miasms* and *Impurities*.

11. I have sufficiently shewn *how unalterable it is in it self*, *Chap.* 15. so that like the *Liquor Alcahest* it is not made to be subdued, but to subdue and resolve *Humours*.

Now, what can be required more in a *Medicament*, and how can the *sensitive Soul* and *Spirits*, (or *Nature*) so invigorated, and endued with all *Euphory* and *Chearfulness* by this *glorious Medicament*, whose *Principles* are not only agreeable to our noblest ones, but more powerful and intimately combin'd, so resolving of Humours, ready to unite the good, and to discuss the bad, and carry them off by the *Pores*, ever fail (being duely administer'd) of good Effect in altering all the *Humours* of our Bodies?

Hippocrates, in his *Book De Naturâ Hominis*, states the Cause of Diseases to be a *Disgregation of Humours*, by which he seems to imply, that the Power of *congregating* and *concentrating* of Humours, were sufficient to accomplish a *Panacea*; which is but one *single Qualification* in eleven of our

our *Sal-Volatile-Oleosum*, tho' this alone (as is experienced even in common Preparations of *Opium*) suffices very often to cure Diseases by composing Commotions, as in *Diary Fevers* from *Perturbations*, &c.

Thus the bitter and firm textured *Cortex* (as I have shewn in my *Book De Febribus intermittentibus*) takes off *Ague Fits*, by re-combining the segregated *Humours* with the Bloud, which it suddenly doing, leaves a Disposition in the Bloud, when ever it meets with a segregating Cause, (as *Purging*, *violent Motion*, *Insolation*, *intemperate Drinking*, &c.) to a *Relapse*, by a second Separation of the Morbid Matter from it, as you have it more at large in my said *Book*, p. 166, 167, &c. 242, 243, &c. where you may see how *Opiates* conduce very much to a speedy Cure by the *Cortex*, by *composing*, &c. *Martianus* says, *Canon. de locis in Homine*, p. 76. *Opium sistit & prohibet humorum Disgregationem*; That is, *Opium hinders Disgregation of Humours*.

Now you may perceive the true *Qualifications* of a *Sal-Volatile-Oleosum*, so much sought for by the *Learned* as a *Panacea*; and how far the common ones, that are sold in the *Apothecaries* Shops, are from being such.

Sylvius (indeed) had an excellent one, with which he did many, and great *Cures*, which being considered, (had he not confessed his Ignorance of the Cause of the Effects of *Opium*) and the Narrative he makes of its Vertue and Performance in his *Preface* to the *first Book* of his *Praxis*, and that he delighted so much in the *Use* of *Opium*, even when he was young, that he was call'd by the Name of *Doctor Opiatus*, and that he declares no Oil was added in its Preparation,

ration, and that it is intimated that the *Oil* and *Volatile Parts* were ſtrictly combined, would have made me ſuſpect, that it was the *Sal-Volatile-Oleoſum* of *Opium* that he uſed, which if it was not, I dare be confident, that (notwithſtanding all its Excellency) it was not as good.

I am very well ſatisfied, that a true and conſummate *Sal-Volatile-Oleoſum* is not to be made barely by *Art*; Enquirers might have better ſucceſs if they ſought it among the Natural Tribe of bitter Plants that are agreeable to the *Stomach*, which have all in them a *Sal-Volatile-Oleoſum*, but how to pick and cull is (I think) beſt ſeen by the requiſite *Qualifications* of a *Panacea* that I have ſtated. There have been many in whoſe Hands *bitter Things* have been as a *Panacea*. One in *Germany* cured moſt Diſeaſes with *Wild Sage*. Some have done great Things with *Agrimony*, others with *Bean Trefoil*, ſome with *Centaury*, others with *Gentian*, *&c.* and the famous Dr. *Lower*'s Practice ran almoſt altogether upon bitter Things, which did him great Service in his *Tincture* of Steel, (as he call'd it) that he often made in Deſtill'd Waters, that could take little or nothing to Purpoſe of the *Tincture* of *Steel*, (whether out of Ignorance or Deſign, I will not, tho' I may determine) which ſhews, that it was the bitter Things that did the good, and made it as a *Panacea*, and not the *Steel*.

However, certain it is, that promoting the *Diſſolution* of Meat at *Stomach*, which the bitter *Salia-Volatalia-Oleoſa* do, is a great Foundation for *Cure*; and (no doubt) our *Sal-Volatile-Oleoſum* does, by its *inciding*, *dividing*, and *reſolving Quality*, contribute very much to a due *ſolution* thereof at *Stomach* by *Connaturalneſs*, as all *Menſtruums* do,

do, (especially if it be *Flesh*, which we use mostly, and requires most help to be resolv'd) which may very well be, tho' it lessens *Appetite* by pleasing *Sensation*; for (as was shewn) it is quite another Thing to cause *Appetite*, (or a *grievous Sensation*) and *Resolution* (or *Digestion*) of the Meat at *Stomach*; for Wine helps *Digestion*, yet, by the *pleasing Sensation* that it causes at *Stomach*, it cures a *canine Appetite*, and at any time (if you'll observe it) takes off the *Eagerness* of *Appetite* for the present; you can better stay without Meat after a *Whet* before Dinner, than you could without it; so that the Wine answers that of a *Whet* as to *Digestion*, tho' not to *Appetite* or *Hunger*, which is a *grievous Sensation* that Wine must rather Cure than Cause.

It is true, that *Wine* or *Opium* may, by causing a sense of *Pleasure* at *Stomach*, cause some stay of the Meat at *Stomach*, but it does not thence follow but the *Digestion* may be the truer, because more gentle and gradual, as it may, and does happen in *Sleep*, when Things that are not very hard of *Digestion* are eaten, which are not good at any *Time*.

You may remember how Blisters (to which *Opium* is near of Kind, as has been shewn) do quickly by their *resolving Nature*, turn the *Cuticle* (as if digested) into a sort of *Gelly*; what a mighty Help would such a Degree of *Resolution* be to the *Digestion* at *Stomach*, when it is, by that Means, like the Skin of a well boil'd Cow-heel, half turn'd to a Gelly, and from a Thing that is very hard of *Digestion*, to be very easie, as is also a *Boar's Skin* in *Brawn* by reason of the *prior Resolution* in the Boiling.

If

If (as *Sanctorius* says) *insensible Perspiration* hinder'd is the Cause of most Diseases, what is more proper to Prevent or Cure them than this *Sal-Volatile-Oleosum*, which causes *Perspiration* above all Things?

I have been lately inform'd, That in some Parts of the most Eastern Countries, they Use *Opium* as a *general Medicament* or *Panacea*.

Dr. *Willis* and *Sylvius* say, it hinders the *Coagulation* of the *Blood*; how many *Chronical Diseases* may it then Prevent or Cure? That is the great Effect of the *Alcahest*, and that is it that mainly qualifies a Medicament for a *Panacea*, as *Courvee* asserts, and all Ingenious Men allow.

Wedelius says, That it happily restores the *Tone* of the *Blood*; What is then wanting to the Preservation of Health?

Paracelsus says, That *Tam homini quam Morbo somnum conciliat*; That is, That it puts the Disease asleep, as well as the Man.

☞ *Platerius* cured the *Gout* with it *safely*, *quickly*, and *pleasantly*, and I know one that can do it, especially if it be at the first coming of the Fit.

Willis gives an Instance of one perfectly cured of a *Dropsie* and Pocky Pains by the Use of *Laudanum*.

☞ *Horstius* perfectly cured an *Hypochondriacal Person*, that was troubled with *Stupidity*, *Watchings*, *Loss of Appetite*, *Trembling*, and direful *Epileptical Convulsions*, and past all *Hopes*, by the *Use* of *Opiates*.

I *my ſelf* have often ſeen *Defluxions* and *Catarrhs* cured by the uſe of *Opiates*, and one of an inveterate ill Habit of Body of many years ſtanding.

Wedelius ſays, That it reſolves the *Grumeſcence* of the *Bloud*, alters and diſſipates the tenuious Parts of it, tempers the acrimonious, *&c.*

The *Ancients* uſed it againſt *Agues* with great ſucceſs.

You may (to confirm this Matter farther) obſerve, that among the conſtant and frequent Effects of *Opium*, there is no bad ones, unleſs there be 2 or 3 purely upon the Account of its *Roſin*, (as has been ſhewn) therefore when it is ſeparated from it there is no Cauſe to fear the *Uſe* of the *Sal-Volatile-Oleoſum*, unleſs it be (as in the Caſe of *Wine*) when 'tis taken in an *exceſſive Doſe*, or uſed *too long* in a laviſh intemperate manner; ſo that when I have ſhewn how duely to prepare it, and the moderate and ſafe *Doſes* thereof, it may be uſed altogether as ſafely as *Wine* in a proportionable *Doſe*; for what Harm can there be in moderately pleaſing the *Membranes*, particularly at *Stomach*? which all the beſt Things we uſe, as *Wine*, *Cordials*, *Meat*, and *Drink*, do, (which are therefore all *Opiates* in ſome degree) thereby aſſuring us of their *Goodneſs* and *Agreeableneſs* to our *Bodies*, tho' they do it not in ſo high a dgree as our *Sal-Volatile-Oleoſum* does, which is the more *Authentick Certificate* of its Excellency; tho' it is to be ſtill confeſſed, that *Exceſs* of the beſt Things, as *Joy*, *Comfort*, *Pleaſure*, *Wine*, *Cordials*, *&c.* have, and may do miſchief; but what need Exceſs therein, any more than in *Wine*, *Meat*, *Cordials*, *&c.* which then (like it) are all inconvenient and injurious to the Body.

All

All this I have ſaid to adminiſter Cauſe to improve the *Practice* of Phyſick by the *Uſe* of this *Panacea*, (now that it is known) by introducing its noble *Uſe* as an *Alterative* to Cure, as well as formerly to palliate *Diſeaſes*, it being a far more beneficial Thing to *Cure* than *palliate*.

Remember how the *Cortex*, *Mercury*, *Antimony*, and other the moſt effectual and glorious *Medicaments* have been traduced, and ſcandalized by the ignorant *Imaginations* of the Unlearned, who having no true *Knowledge* of the *Vertue* of Things, wholly depend upon *Fears* and *Jealouſies* to guard them from their imagined ill *Effects*, which (generally ſpeaking) only the ſame *Ignorance*, *Fears*, and *Jealouſies*, gave a *Phantaſtical Being* to.

It remains, that I in the next Place ſhew you;

1. *The true Preparation of this* Panacea *or* Sal-Volatile-Oleoſum.

2. *Other Preparations of* Opium *that are next it in Safety and good Effect, and why they are ſo.*

3. *The moderate and truly ſafe Doſing of them all*; there being no Danger in well prepared *Opium*, but from *Exceſs* in the *Uſe* thereof.

CHAP. XXV.

Of the Preparation of the Panacea, *or true Sal-Volatile-Oleosum of* Opium.

SEeing that the *Sal-Volatile-Oleosum* of *Opium* must be such an effectual, generous, and general *Medicament*, that is both *cordial* and *alterative* in so transcendent a manner, it well deserves a careful and curious *Preparation*; therefore I will be very particular therein. To that end,

1. *It must be separated from all the noxious Rosin, and all Filth and Dross of the Opium.*
2. *It must be kept entire without weakening, or any way altering it, or adding a new Quality thereto.* Therefore,

I. *Opium must not be torrefied*, according to the *Common Practice*; 1. Because the finest and most volatile Part (which is the very best) is thereby lost. 2. Because the resinous and earthy Parts (which are not spent that *way*) grow more in Proportion to the *Sal-Volatile-Oleosum*; so that *torrefying* cannot be allow'd, unless preserving the *Bad*, and destroying the *Good*, be allowable. The vain and ostentatious Pretence of destroying (I know not what) *narcotick Sulphur*, (which is a Nick-name given by Ignorance to the best Parts of *Opium*) is most insufferable stuff. 3. Because all *Empyreum* (which renders it very nauseous) can hardly be avoided in torrefying it; but suppose it were, What need is there otherwise so to damnifie it? (as is aforesaid.)

Obj.

Obj. It is found to be more innocent, after ſuch *Torrefaction.*

Anſ. I grant that it happens ſo ſometimes; but it muſt be meerly by *Accident*; either, 1. Becauſe it meets with a ſtrong *Digeſtion* at *Stomach*; *Or*, 2. By the Cuſtom of poudering it, which is always directed, and done after the *Torrefaction*; by which means the *reſinous Parts* being divided and ſevered, become leſs liable to a *Coaleſcence* at *Stomach*, and conſequently leſs offenſive and more ſubduable: Eſpecially, 3. When it is mixed (as generally it is) with other things that keep the Parts of the *Roſin* from *Coaleſcence*, and leave them more conquerable by the *Digeſtion*, as the *Ancients* found by *Experience*; who therefore did generally, if not always, mix it in a ſmall quantity, with many other things in great quantity, in the form of *Electuaries*, as in *Venice-Treacle*, *Mithridate*, *&c.* though nothing in them corrected the *Opium* otherwiſe than by dividing and ſegregating its Parts. This indeed is like that of *divide & impera*, or interlining ſuſpected Soldiers with truſty, or friendly ones, to prevent a miſchievous *Conſpiracy*: But how much better is it to have no Enemy to conteſt with, by a due and compleat ſeparation of the Roſin from the *Opium!* Otherwiſe you muſt be obliged to good Accidents, if ever torrefied *Opium* becomes ſafe, becauſe all the *noxious Roſin* is left in it.

Therefore if after *Torrefaction* you will give it in a Maſs, without poudering it, and mixing it with other things, you'll find its ill *Effects* to be as bad, if not worſe, than ever; as you will alſo, if you afterward extract it out of *Spirit of Wine*, reducing it into the *Form* of *Pills*, by which means the

the ſevered Parts of the *poudered Roſin* do again coaleſce into a *lumpiſh Condition*, which renders it worſe than *crude Opium*, as *Wedelius*, my ſelf, and others do teſtifie; becauſe the *Opium* being ſomewhat weakened, and all the *Roſin* remaining, the *Doſe* of the *Opium*, and conſequently of its *Roſin*, muſt be increaſed. As, ſuppoſe 8 Grains of *crude Opium* has 2 of *Roſin*, 2 of other *Droſs*, 2 of *Phlegm*, and 2 of *Sal-Volatile-Oleoſum*; and that 2 *Grains* of the *crude Opium* containing *half a Grain* of the *Sal-Volotile-Oleoſum*, was the *Doſe*; then if in *torrefying* it, one Grain of the *Sal-Volatile-Oleoſum* be loſt, and another of the *Phlegm*, there will remain only 6 *Grains* of the *Opium*, with the Virtue of one Grain of the *Sal-Volatile-Oleoſum* in it; therefore 3 *Grains* of it muſt be now uſed, to have half a Grain of the *Sal-Volatile-Oleoſum*, which 3 *Grains* will contain half the *Roſin* of the whole Maſs, that is, one *Grain*; whereas there was but *half a Grain* thereof in the 2 *Grains* of *crude Opium*: Therefore torrefied *Opium* is in it ſelf much worſe than crude *Opium*.

And it is yet worſe, if after *Torrefication* you make an *Extract* of it in *Spirit of Wine*; for then the *Droſs* and *Phlegm* being ſeparated from the 6 *Grains*, nothing will remain in the *Extract* but the *reſinous Part*, with leſs of the Virtue of the *Sal-Volatile-Oleoſum*, which is not taken up ſo greedily, as the *Roſin* is, by the *Spirit of Wine*; beſides that, ſome of this *Volatile Part* may be loſt, and that the *Roſin* is now more compacted, as not having as much as the droſſie, earthy, or watry Parts to ſever and keep its *noxious Particles* at a diſtance, to render them (as was ſhewn) more ſubduable and digeſtible at *Stomach*. See what Pains the inconſiderate World does take (and exceedingly boaſt of) to render *Opium* by *Torrefaction*, *Ex-*

traction in *Spirit of Wine*, *&c.* at leaſt twice as noxious as *crude Opium*, without accounting how far the *Sal-Volatile Oleoſum* that remains is impair'd by the *Fire* and *Spirit of Wine!* It is therefore no *Wonder* that *Wedelius* declares, That he found more Miſchief by ſuch *Extracts* out of *Spirit of Wine*, than any other *Preparation* of *Opium*. It is plain then,

II. *That we muſt not extract it out of Spirit of Wine*, or any ſuch *ſulphureous Menſtruum*; 1. Becauſe more apt to extract the *Roſin* than the *Sal-Volatile-Oleoſum*. 2. Becauſe the *Roſin* will be more compacted. 3. Becauſe the *Spirit of Wine* may in ſome meaſure alter it.

III. *We muſt not extract Opium firſt out of Water, and afterward out of Spirit of Wine, and then mix them together, and evaporate them to an Extract*: For this is (as was ſaid) wiſely taking care to add the *Poiſon* to the *Panacea*, or *Roſin* extracted by the *Spirit of Wine*, to the *Sal-Volatile-Oleoſum* extracted by the *Water*; beſides the Impair and Loſs made of the *Sal-Volatile-Oleoſum* by the *Spirit of Wine*, and the *Evaporation*, how gentle ſoever it be.

Here it will be ſeaſonable to *note*, That there is a general great *Fault* committed by Preparers of *Medicaments*, eſpecially ſuch as pretend to moſt *Curioſity* therein, in endeavouring (*right* or *wrong*) to have all the Principles of the Plant, *&c.* join'd together in their *Medicaments*, however *noxious* or *contrary* to the Purpoſe, (as you ſee in the *Inſtance* juſt now mentioned) whereas they had much better do as the great *Helmont* ſays, *Pharm. & Diſpenſ. Modern.* 12. "*Sanguinem a cruore, & Parenchymale* "*Plantarum diſtinguere, & ſeparare diſcant Tyrones,*

"*ſi*

" *ſi quicquam laude dignum per ſimplicia egiſſe meditentur.* That is, " *Let Beginners learn to diſtinguiſh* " *and ſeparate the true Bloud of Plants from their* " *Cruor (or dead Gore) and Parenchyma, if they* " *think to do any thing Praiſe-worthy by Simples.* You'll find this to be very pat in the true *Preparation* of the *Sal-Volatile-Oleoſum*, whoſe *Ruby-colour* makes it look like *Bloud*, while the *Roſin*, *Earth*, and *Droſs*, make the Appearance of a dull and dead Cruor, (or *Gore.*)

If they took a *Tincture* of *Opium* in *Spirit of Wine*, and uſed it ſo, it would not be ſo bad; for then the *reſinous Particles* are diſſeminated, and not ſo liable to *Coaleſcence* at *Stomach*; but ſo great is the Stupidity, that they take care, by reducing it into the *Form* of an *Extract*, to combine them and make them as noxious as is poſſible; and then they think them worthy to be boaſted of as their *Noſtrums*, proclaiming their *Ignorance*, and glorying in their greateſt *Shame* and *Diſgrace* of Mankind, that Humane *Species* ſhould have any ſuch *unthinking Brutes* in it.

IV. *We muſt not uſe Acids in the Preparation thereof*; 1. Becauſe being in their *Nature* oppoſite to *Volatile Salts*, it cannot be done without Injury to the *Sal-Volatile-Oleoſum* of *Opium*. 2. Becauſe they cannot ſo well agree with the *oily Parts* of it. Yet are they not ſo much to be blamed as *Extracts* made in *Spirit of Wine*, or *ſulphureous Menſtruums*; becauſe *acid Menſtruums* leave the *Roſin* behind them untouched, or not extracted.

V. *A Salino-Volatile Menſtruum*, as *Spirit of Sal Ammoniac*, of *Urine*, *&c.* is not ſo proper: 1. It may render the *Sal Volatile-Oleoſum* of *Opium* too acrimonious. 2. Becauſe by its Volatility, Acri-

mony, *&c.* it may cauſe too great a ſtir in the *Bloud, &c.* and ſo oppoſe or hinder *Sleep*, which is one of the moſt happy and uſeful *Effects* of *Opium*, (or its *Sal-Volatile-Oleoſum.*) 3. Becauſe it may have undue *Effects* by altering its *general Diſpoſition:* Nay,

VI. *We are not to uſe a lixivial Menſtruum*, (tho' ſo much cried up) 1. Becauſe it extracts the *reſinous Parts*, which *(experto crede Roberto)* I have found to be pernicious upon that account, like *Extracts* in *Spirit of Wine*, unleſs great care be taken to ſeparate thoſe *Parts* (which is not eaſily done) by *Filtrations, &c.* 2. Becauſe being very apt to join with the oily Parts, and quite to deſtroy their Nature, by converting it into a kind of *Sapo*; it may deal ſo with ſome of the *oily Parts* of the *Sal-Volatile-Oleoſum* of *Opium.* 3. Becauſe there is no need to run any of theſe Hazards, ſince the *Sal-Volatile-Oleoſum* may be *(as I ſhall ſhew)* eaſily extracted in its *Purity*, without thoſe *Troubles* and *Dangers.* 4. Becauſe any Tincture made thus is apt to let go the *Roſin* at *Stomach*, if it be diluted with aqueous Moiſture taken before, with it, or after it; which ſo being let go, coaleſces, and does miſchief.

VII. *The uſe of Fire* any way (beſides that of its Torrefaction) is much to be ſuſpected: 1. Becauſe the *Sal-Volatile-Oleoſum* may be in ſome meaſure thereby evaporated: Or, 2. An *Empyreum* contracted: And, 3. The *Roſin* (as was ſaid of its *Torrefaction*) grows the more in Proportion, if any of the *Sal-Volatile-Oleoſum*, or but the *Phlegm* be (by that means) evaporated, and the *Remainder* kept for *uſe.* And particularly,

VIII. The Diſtillation thereof may cauſe mighty Alterations in its *Properties, Strength*, &c.

We

We muſt therefore avoid all theſe *Ways* of preparing it, and yet muſt we,

1. *Separate the Sal-Volatile-Oleoſum of Opium from all its Roſin, Earth, Filth, and Droſs.*

2. *No way weaken it, alter it, or add new Qualities thereto,* but preſerve this moſt Noble and *Ineſtimable Medicament* in its *Purity* and *Sincerity.*

To this end *Rain water diſtill'd,* uſed cold, anſwers all Intents: For,

1. It readily imbibes the *Sal-Volatile-Oleoſum* of *Opium*, without *Fire, Heat, lixivial Salts,* as *Salt* of *Tartar, &c.*

2. It imbibes none of the *Roſin* of the *Opium,* but lets it all ſubſide together with the earthy and droſſie Parts, ſeparating the lighter *Filth* (if there be any) to the *ſurface.*

3. It no way weakens, alters, or adds any new *Quality* to the *Sal-Volatile-Oleoſum.*

4. Whatever cold Water diſſolves, which is the *General Drink,* or *Menſtruum,* appointed by the *All-wiſe Creator* for the Diſſolution of all Things taken into the *Stomach* of *Animals,* is eaſily diſſolved at *Stomach* by its more powerful and agreeable *Menſtruum.* And not only ſo, but,

5. *Water* it ſelf is a mighty *Stomachick,* and *Cauſer of Digeſtion,* as *Hippocrates* poſitively declares, *L. 6. Epidem. Sect. 4.* But there's no need of quoting *Hippocrates* in ſo notorious a thing, daily Experience tells us the ſame: Do not all *Animals,* by its Help, digeſt their Food? Do not all *Mineral Waters* (ſcarce any excepted) create an *Appetite,* and cauſe *Digeſtion,* even when no ſuch *Effect* can be attributed to the *Mineral* they contain? Than which they do alſo (as

may be very eaſily proved) more good (generally ſpeaking) ἄριστον μὲν ὕδωρ; for which, and many more *Reaſons*, it is great *Neglect* and *Folly*, that it is not more uſed for *Extracts*, *&c.* for then they readily diſſolve at *Stomach*, and thereby *ſweetly* and *ſpeedily* take *Effect*, giving it the leaſt *Labour* and *Diſturbance* that may be, as is experimentally found in that of *Aloes*, *Scammony*, *Briony*, *Hellebor*, *Agaric*, *Rhubarb*, *Coloquintida*, *Sena*, and what not? unleſs the *Vertue* lies in the *reſinous Parts*; for then *ſulphureous* or *lixivial Menſtruums* are convenient. How inconvenient are they then, when the *Evil* or *Miſchief* lies therein, as in our caſe!

6. It is not to be doubted, but *Water* generally imbibes what is beſt and moſt agreeable to our *Bodies*, it being the *general Menſtruum* appointed by *Wiſdom* it ſelf for that *Uſe*, and to be the *Vehicle* of what is beſt in all our Food, *&c.* to the *Blood*: However, there can be no *doubt* of (what mainly concerns us at preſent) its moſt ready diſſolving our *Panacea* in the *Stomach*, that does it out of it, when cold, without the convenient digeſtive Heat and powerful *Menſtruum* that it finds there. Therefore,

Take *of diſtilled Rain-water* 24 *Ounces*, *of choice Opium ſliced thin* 8 *Ounces*; *put them together in a ſtrong Glaſs Veſſel of Bottle-metal*, *that contains about* 3 *Pints*; *let it be of a tall Figure*, *with a Mouth that conveniently receives a Cork*, (*a large Glaſs Bottle may ſerve the turn*;) *cork it ſo as the Cork may be eaſily taken out*, *ſhaking it* 3 *or* 4 *times a day for* 6 *days*, *and keeping it in a place free from Froſts*, *or any very ſenſible degree of Heat*: *Which being performed*, *lay the Veſſel ſide-long for* 24 *hours longer*, *and afterward decant and filtre your Tincture*, (which will be of a *Ruby colour*) *and put it into a Glaſs*

Bottl

Bottle of ſuch a Bigneſs as that it may fill it within a ſmall matter of the Cork; and ſo let it ſtand for 3 *or* 4 *days; then pour off ſome of the ſurface of it, and inſtead thereof, put ſweet Oil thereon: Let the Veſſel have a convenient Duct, or Pipe, in the ſide thereof, to empty it out upon occaſion.* This I call the *Liquid Panacea* of *Opium.*

To the Fæces *add a Pint of cold diſtill'd Water, ſhaking the Veſſel* (as before) 3 *or* 4 *times in the day; let it ſtand on it* 24 *hours, and in the morning decant it into another Veſſel; repeat the ſame quantity of diſtill'd Rain-water, till the Opium no longer tinges it, or very inconſiderably in* 24 *hours: At laſt you may uſe Water kept hot by a Fire,* &c. *the better to extract the remaining* Sal-Volatile-Oleoſum. *Evaporate all theſe laſt Waters in* Balneo *to the conſiſtence of an Extract.* This I call the *Solid Panacea* of *Opium.*

GOD and *Nature* act by ſimple Means; and nothing (in imitation of Them) is more commendable in a *Medicament* than *Simplicity*; therefore I ſhall add nothing to the *Panacea's*, but wholly leave that to other *Phyſicians* to pleaſe *themſelves* or *Patients*, by adding *Ambergriſe*, *Muſk*, *Saffron*, *Oil of Cinnamon*, or *other chymical Oils*, *Sugar*, or the like, according to their *Intent.*

I have obſerved, That (as Reaſon tells us) its *Smell* is beſt palliated by other *rank Smells*, as that of *Onions*, *Garlick*, *Aſa-fœtida*, *&c.* and its *bitter Taſte* with bitter things, as *Gentian*, *Centaury*, *&c.* Therefore when Perſons that know its *Smell* and *Taſte* are avers to take it, (if the other more acceptable Things will not ſuffice for that purpoſe) uſe ſome of theſe; You may, when you are in haſte, infuſe half a dozen ſlices of *Gentian-root*,

and one ſlice of an *Onion*, or a bruiſed *Clove* of *Garlick*, or both, in a *Glaſs* of *Wine*, for one hour for a *Vehicle* in that caſe: 'Twere better to infuſe them longer, if you have time; but you'll find, that the *liquid Panacea* has not ſuch a mighty rank Taſte, or Smell, but that it is eaſily palliated by ſuch means, if the *Opium* had no *Empyreum*. The *ſolid Panacea* may be alſo palliated by the ſame Things, conveniently mixed therewith.

I know there are other *Ways* and *Means* to ſeparate the *Roſin*, *&c.* as extracting a Tincture of *Opium* in Spirit of *Wine*, and afterward precipitating the Roſin with diſtilled Rain-water; but this is attended with more Trouble and many Inconveniences, that are avoided by the *cold diſtilled Rain-water*: For, 1. You know not how the *Spirit of Wine* may (as was ſaid) alter it. 2. This is going round the *Buſh*, and compounding two *Menſtruums* together, whereas the ſimple *Water* uſed alone is much better. 3. You cannot thus ſeparate the reſinous Particles ſo perfectly, by *reaſon* that the *Spirit of Wine* muſt retain ſome of them; and if you add more and more *Water* in the *Precipitation*, the Tincture becomes too much diluted, and very weak: How much better is it to uſe a *Menſtruum* that never takes up any *Roſin*, and conſequently needs no ſuch *Separation* and *Labour* of *Precipitation!* It is better not to admit an *Enemy* to one's Country, than afterward to endeavour his *Expulſion*; for he will at beſt leave ſome Marks of his Hoſtility behind him, as the *Roſin* will in the *Spirit of Wine*.

The

The like *Inconveniencies* there will be in ſeparating it by the way of *Diſtillation*; as, 1. The altering of it by the Tyranny of Fire. 2. The loſs of it by *Evaporation*. 3. The addition of the Particles of Fire thereto. 4. The never ſeparating it ſo well that way. 5. The diſuniting of the *Oil* and *Volatile Salt* in ſome meaſure. But what Experience may hereafter teach Men, I will not determine, neither can I.

But this I can, That as it was even *miraculous*, that People ſhould never mind the Cauſe they daily *felt*, and ſolicitouſly *ſought* for; ſo it is as ſtrange that they could not hit upon the plain Uſe of Water (ſo very common in all Hands) for a *Menſtruum*, either by *Chance* or *Conſideration*, in all the *Eaſtern* Parts of the World, where it is ſo univerſally taken, or in the inquiſitive *Weſtern* Parts of the World, where it has been ſtudied and conſidered by great Numbers with the utmoſt *Diligence*: But they paſſing over *Water* as deſpicable, becauſe common, (for Familiarity breeds Contempt) tho' its being made the *Drink* of all living Creatures by the *Omniſciens* ſhould commend it above all things, did like thoſe, that regardleſly paſs over a *Jewel*, or *Treaſure*, and having once left it behind them, proceed farther and farther from it, the greater progreſs they make, concluding that it was not to be found the way they paſs'd; not becauſe it was not there, but becauſe they could not ſee it.

As for the keeping of the *liquid Panacea* uncorrupted, I do not find it apt to change; however, becauſe made ſo eaſily by bare throwing it into Water, it need not be kept long, but may be made upon all occaſions, or at leaſt one under the other,

other, as the Apothecaries ſpend it, who (it is not improbable) may by their great *Ingenuity* and *Experience* in thoſe Matters, find other convenient Means to preſerve it for their purpoſe.

CHAP.

CHAP. XXVI.

Of other Preparations of Opium, *that are absolutely or tolerably safe in a moderate Dose.*

I. *ALL Preparations are very safe in a moderate Dose, wherein the resinous Part of the* Opium *is wholly separated from it.* Such are all *Extracts* made in *aqueous Menstruums*, or any other that imbibes none of the *resinous Parts* of *Opium*: As the *Preparation* that *Wedelius* has in his *Opiologia, L. 1. Sect. 2. Cap. 5. p. 65.* which is extracted out of *Phlegm* of *Vinegar* that remains after the Preparation of *Arcanum Tartari.* So *Laudanum liquidum Cydoniatum*, and *Langelott's Laudanum*, if the resinous Part be duly separated, are very safe and commendable for the like *Reason*; as is also *Le Mort's* Extract out of *Rain-water, Diacodium, &c.*

II. *All Preparations wherein the resinous Parts of* Opium, *tho' not separated from it, are so alter'd, order'd, divided, &c. as not to stick to the Stomach, and render'd digestible and passable out of it without Offence,* may be safely used. Of this kind there are, or may be two *Sorts:*

First, Such wherein the Nature of the *Rosin* is altered (in some *degree* at least.)

Secondly, Such wherein, tho' the *Nature* of the *Rosin* is not destroy'd, yet is it so ordered, divided, *&c.* as not to stick to the Stomach, but render'd digestible and passable without Offence.

Of the *Firſt Sort* are,

1. *Such Preparations, wherein the reſinous Part of* Opium *is quite altered in its Form and Nature by Chimiſtry, or artificial Tortures of Fire*; which becauſe hardly to be done without much impairing the *Sal-Volatile-Oleoſum*, will be neither commendable, nor worth while, conſidering how eaſily, without that *Trouble*, *Pains*, and *Labour*, even the *Roſin* it ſelf may be ſeparated wholly from the *Opium* by *aqueous Menſtruums*.

2. *Such Preparations wherein the reſinous Parts of* Opium *are altered, and* (as it were) *ſoapified by lixivial Salts or Soaps*, which readily engage and intimately join with the ſmall *reſinous Particles* of the *Opium*, by long and ſtrong pounding them together in a *Mortar*, or otherwiſe (as in *Matthew's* (or *Starkey's*) *Pill*, *Bates's Pacifick Pill*, *&c.*) by which means thoſe *reſinous Particles* become (in a great *degree* at leaſt, if not wholly) miſcible with, and ſo diſſolvable, and digeſtible in the Liquors we drink, and eaſily ſubduable by the *Menſtruum* at *Stomach*, out of which it alſo eaſily paſſes, by *reaſon* of the great ſlipperineſs it acquires (which alſo prevents its ſticking) by that intimate mixture with the *Soap* (or *Lixivials*:) Therefore I take thoſe *Pills* of *Matthews's*, and Dr. *Bates's*, to be *ſafe Preparations*, tho' not to be compar'd to the *Panacea*, wherein all *Danger* and its *Cauſe* is quite taken away by wholly ſeparating the reſinous Parts, *Earth* and *Filth*, of the *Opium* from its *Sal-Volatile-Oleoſum*: And (doubtleſs) had *Matthews*, *Starkey*, and *Bates* known, that the *Roſin* of *Opium* had been the Cauſe of its ill *Effects*, they would never have ſpent *Months* in preparing the *Sapo tartareus* to correct *Opium*, when they might, with the hundredth part of the Trouble, and fortieth

tieth part of the *Time*, wholly have taken away the *pernicious Part* by *aqueous Menſtruums*, which they only pretend to correct by the *Sapo tartareus*; tho' I allow it (for the *Reaſons* aforeſaid) to be a good *Corrector*, yet cannot it equal the total *ſeparation* of the *pernicious Parts*.

I am of Opinion, (upon my beſt *Thoughts* and ſome *Experience*) That intimately mixing and ſubduing *Opium* with good white *Soap*, may (for the *Reaſons* aforeſaid) prove a good and ready *Corrector*, or Preventer, of the *Adheſion* of the *reſinous Parts* of *Opium* to the *Stomach*, much conduce to its *Diſſolution*, or *Digeſtion* therein, and nimble ſlipping out of it, and thereby prevent all the *ill Effects* of *Opium*, which it cauſes by the *Adheſion* and *Indigeſtibleneſs* of its *Roſin*.

Of the Second Sort *of* Preparations *of* Opium, *wherein its* Roſin *remains wholly unaltered in its Nature, yet becomes ſafe by dividing it*, &c.

This is mainly, (if not altogether) done by a fine and through *Diviſion* of the reſinous Parts of *Opium*, and keeping them afterwards from a *Coaleſcence* in, and *Adheſion* to the *Stomach*, by which means they become digeſtible, or at leaſt paſſable without Offence. This may be done,

1. *By Torrefaction, till the* Opium *is very friable, and then finely poudering it*, and mixing it with ſuch things as are of good *Conſiſtence*, *&c.* to keep the Parts of *Opium* from a *Coaleſcence*, as in *Venice Treacle*, *Mithridate*, *Diaſcordium*, the *Philoniums*, *&c.* This was the *Way* and *Method* that the *Ancients* uſed; which cauſed *Galen* to ſay, "*That* "*Opium alone* (that is, undivided and unmix'd with "other things to prevent its *Coaleſcence*, *&c.*) *was* "*dangerous; but mixt with other things was ſalutiferous*,

(which

(which they found by *Experience*, not knowing the Cauſe, but attributing the Safety thereof to ſomething among the many Ingredients as a Corrector of the *Opium*.) Hence it was that they put ſmall Quantities thereof into Electuaries made of many and much other *things*, that kept the Particles aſunder; which they did ſo commonly, that (at laſt) all *Electuaries* were call'd *Opiates*. Thus we had thoſe *Compoſitions* above named, which are ſafely uſed for the *Reaſons* aforeſaid; not that any thing therein corrects I know not what *poiſonous* or *narcotick Quality* in *Opium*, but that the other Ingredients divide its *Roſin*, and afterward keep its *Particles* from *Coaleſcence* and *Adheſion*.

2. *Diſſolution of Opium in Spirit of Wine*, or ſuch *ſulphureous Spirits* which finely divide the *Roſin*, and uſing the bare *Tincture* before the reſinous Particles are again compacted (as in *Extracts*, *&c.*) may be of *uſe*, if duly adminiſtred.

But here a *Caution* is to be uſed, That you take it not in, or drink any *aqueous* or *phlegmatick Liquid* with it, or before, or after it, in two or three hours; which if you do, the *reſinous Particles* will be precipitated thereby, and ſo ſtick to the *bottom tom* of the *Stomach*, cauſing thereby the uſual ill *Effects* of *Vomiting*, *Anxieties*, *&c.* Therefore it ſhould be given only in a *ſpirituous Liquid*.

Note alſo, That if you give a *Solution* thereof in any *Lixivium*, you take Care not to dilate it by any *Means* by *aqueous Liquids* in Two Hours before or after you take it; for then there being but little Lixivial Salt in proportion to the Liquid, the *reſinous Parts* are let go, and precipitated to the Bottom of the *Stomach*; as in the Caſe of the *Spirit of Wine* ſo dilated: Of which I have ſeen a very convincing *Inſtance*; for one that had an Eſteem of *Lixivials* in this Caſe, not only (according to *Helmont*, and the *Common Cry*) to correct

rect *Opium*, but also to extract its *Vertue* the more effectually, made a *Tincture* of *Opium* in *Water*, lixiviated with *Salt* of *Wormwood*, whereof he took the Quantity that he had seen me give of my *Liquid Panacea*, in a *Coffee-Dish* full of *Water*, which precipitating the *Rosin* in the *Stomach*, caused him to *Vomit* in about an *Hour* after, and continued so to do for about 15 *Hours*. By which you plainly see, that the great Secret of *Lixivials* to correct *Opium*, lies meerly in its *Division* of the *Rosin* thereof, (as in the Case of *Spirit of Wine* and *poudering* it) and afterward keeping its *Particles* asunder during its Stay at *Stomach*; which the *Sapo tartareus* does (and probably other *Soap* may do) very well, for the several *Reasons* aforesaid.

3. *Dissolution of* Opium *in the Yolk of a rear new laid Egg*, by pounding the Dose that you intend to take, with a little Quantity of the *Yolk*, till both be thoroughly mixed, and then taking it in the remaining Part of the Yolk: By which Means you not only finely divide the *resinous Parts* of the *Opium*, while the *Yolk* of the Egg intimately mixes with them, (as it does with other *Rosins* and *Turpentines*) but send along with it into the *Stomach* what is digestible in it self, and more and more divides and separates the *resinous Parts*, and highly contributes to their final *Dissolution* and *Digestion*; so that (I doubt not) but you'll find this *new*, ready, and agreeable *Means*, as good (if not better, all Things considered) than the former, and even equal to the *Sapo tartareus*.

By what is said, tho' short, you may (because it is the clear Truth of Things) Judge of the *Goodness* of all Preparations of *Opium*. And,

1. *That*

1. *That reſinous Things ſhould not be added to Opium*; becauſe ſuch (like its own *Roſin*) renders it more indigeſtible, and apt to ſtick at *Stomach*: Hence it is, that the *Styrax Pill*, having reſinous Things in it, and crude *Opium*, does ſo often cauſe diſmal *Effects*, tho, (forſooth) much eſteem'd for the *Lungs*, *Coughs*, *Defluxions*, *&c.* for having ſuch *Balſamick reſinous Things*, as *Styrax*, and *Olibanum* in it, whereas the Benefit is from the *Opium*. Had Dr. *Bates* known the Cauſe of the *Miſchiefs* of *Opium*, he would never have put *Benjamin* in his Pacifick Pill.

2. *That all Preparations made of Extracts in Spirit of Wine, are to be rejected*, ſuch *Extracts* being much worſe than *Crude Opium*, and Experimentally found to be ſo; therefore our common *London Laudanum*, being made of *Opium* prepared in Spirit of Wine, is no commendable Preparation, tho' ſo much uſed, and cried up; which alſo *Experience* proves, in that it ſometimes cauſes the ill *Effects* of *Opium*, when given alone in a good *Doſe*. You'll find more of theſe Matters when you come to *Chap.* 29. which conſiſts of *general Rules* and *Cautions* concerning the Uſe of *Opium*, therefore (tho' I may add ſome Uſeful *Obſervations*) I put an end to this Matter at preſent for that Reaſon; and becauſe what is to be truly done in the *Preparation* of *Opium* is very evident from what is ſaid, ſince the Cauſe of the *ill Effects* of *Opium* is now certainly known to be its *Roſin*; to the *Separation* or due *Alteration* of which, ſo as to cauſe it to paſs the *Stomach* without *Adheſion* or Offence by its *Stay* or *Indigeſtibleneſs*, all regard muſt be had in the *Preparation* thereof, as is in the following Preparations, which are therefore ſafe.

CHAP.

CHAP. XXVII.

Shews the best Preparations of Opium, *where to find them, and what is their respective Dose,* &c.

YOU may infer out of the Premises, which are the best *Preparations* of *Opium*, viz.

1. *Such as have the resinous parts of* Opium *separated from them*; as,

1. *The liquid Panacea of* Opium. } Described in C. 25. of this Book.
2. *The solid Panacea of* Opium }
3. *Diacodium (or Syr. e mecon.)* —— In the *London Dispensatory.*
4. *Laudanum liquidum Cydoniatum* —— In experienced *Mr. Wilson's Chymistry*, and in curious *Mr. Stephurst's Officina chymica Londinensis.*

Note, That there are several needless Proceedings in this *Preparation*, as that of putting *Yeast* to it &c. Let your Aim in making it be to separate the *resinous Parts*; therefore instead of two Expressions directed, use only a careful *Decantation*, because the *Rosin* may pass by *Expressing* it.

5. *Wedelius's Laudanum*, which is his *Opilogia*, *L.* 1. *Sect.* 2. *Cap.* 2. *P.* 65.

Note, That the *spumous part* on the *Surface* is to be taken off, and the clear *Tincture* to be decanted from the Fæces, and afterward evaporated in *Balneo*, to the Consistence of an *Extract.*

6. *Le Mort's Extract out of Rain-water*, which you have in the most Learned *Dr. Love's Collectanea Chymica. P.* 304.

II. *Such Preparations, wherein the resinous Parts of Opium are altered, and as it were soapified by lixivial Salts, or Soaps*; viz.

1. *Dr. Starkey's, or Matthews Pill*, which you have in *Mr. Wilson's Chymistry*, p. 271, 272. In ingenious *Mr. Shipton's Pharmacopœia Bateana*, among the *Pills*; and in *Mr. Stapburst's Officina Chymica Londinensis*, among the *Laudanums* p 51.

Note, That the main Things to be regarded in the making up of this *Pill*, are 1. To spare no Labour in pounding, subduing, and intimately mixing the *Sapo tartarens* and the *Opium*. 2. That the *Sapo* should be twice as much as the *Opium*; that it may the better subdue the resinous part of the *Opium*.

Note, That as to the other Things contain'd in the said *Pill*, they may, or other things be added, or omitted, according to the Intention of the *Physician*; only this I say, that it is very convenient other things should be added to the *Sapo* and *Opium*, the better to separate and disgregate the parts of the *Opium*, (as has been intimated.)

Note, That if the Mass be too dry, you may (as Mr. *Wilson* directs) use some of the Oil that separates from the *Soap*, or rectified Oil of *Turpentine*, *q. s.* to moisten it.

2. *Dr. Bates pacifick Pill*; which you have among the *Pills*, in *Mr. Shipton's Pharmacopœia Bateana*.

Note, That the same Things are to be observ'd, as to this and *Starkey's* Pill, in all Particulars.

Note, That the *Benjamin* should be omitted, as being *resinous*.

III. Such

III. *Such Preparations of* Opium, *wherein its noxious Parts remain unalter'd in themselves, yet so divided, separated, &c. as to be render'd innocent, such are,*

1. *Venice Treacle.*
2. *Philoneum Persicum.*
3. *Philoneum Romanum.*
4. *Diascordium.*
5. *Mithridate.*

} All which you have in the *London Dispensatory.*

Note, That in all these *Preparations,* the *Opium* should be carefully mixed with the other Ingredients; and to that end, either torrified and finely pouder'd, or dissolved in Water, which divides all its Parts, and then throughly mixed with the other Ingredients while 'tis oft, or after 'tis reduced by *Evaporation* to the *Consistence* of a *Syrup,* or somewhat thinner.

6. *Sydenham's Laudanum,* which you'll find in *Mr. Wilson's Chymistry.*

Note, That the main Care in this Preparation, is to let the Liquor have a sufficient time to clear from the *Faeces,* and to separate from it; that you may by that *means* have less of the *Rosin.*

Note, That this is best given in a *spirituous Liquid,* lest its *Rosin* (tho' it cannot have much in it, if well decanted) be precipitated at *Stomach.*

Note, That the *Henbane-seed* in the *Philoniums* should be left out, 1. Because it makes the *Dose* more uncertain. 2. Because it is not to be esteem'd so much as *Opium*; at least you multiply things without necessity in putting it in.

Note, That Pil. e Cynogloſſo (as was ſaid in the *laſt Chapter* of *Pil. e Styracc*) is a very ill Compoſition, both upon the Account of the *reſinous Things* that it contains, as alſo the *reſinous Preparation* of *Opium* that it is made of; and therefore does (as that *e Styrace*) often cauſe grievous *Effects*: Nor do I think the *London Laudanum* (whoſe Name does probably recommend it more than any Thing elſe) worthy a Place among the *beſt* and *ſafeſt Preparations*, becauſe the *Opium* is render'd worſe, or more reſinous, than the crude, by being extracted out of *Spirit of Wine*; and becauſe it has too few other Ingredients to divide, ſegregate, and keep its *reſinous Parts* from *Coaleſcence*; ſo that it may, and ſometimes does cauſe ill Symptoms; ſo *Philonium magiſtrale* is to be rejected for the like *Reaſons*, beſides that it is otherwiſe a fooliſh *Preparation*, becauſe *Opium*, *Benjamin*, *Myrrh*, and *Mummy*, are ordered to be made an *Opiate*, or *Electuary* with *Spirit of Wine*, which is ridiculous. So *Troch de Carabe*, and *de Terra Lemnia*, are not without their Faults, becauſe one has *Frankincenſe*, and the other *Olibanum* in it, (which are reſinous) tho but in a ſmall Quantity. *Seif de Thure*, having a great Quantity of the *Frankincenſe*, is not commendable, ſince the *Opium* is alſo crude.

Now having ſhown you, which are the beſt and worſt *Preparations*, and why; it remains, that I ſhow you the *juſt Doſes* of the *beſt* and *ſafeſt*; whoſe Number is very ſufficient to anſwer all Intents, without medling with ſuch as may not be ſo ſafe, or neat.

An

An Explanation of the Table of Doſes.

I Had once added an *Explicatory Table* of the *Marks* I uſe; but afterward conſidered, that all *Phyſicians* and good *Practitioners* in Phyſick do know them, and that it was not fit to intruſt others therewith. Therefore I ſhall only add ſomething for the better and readier *Uſe*, of the premiſed *Table* of *Doſes*.

1. *Note*, That the ſort of *Perſons*, that you have to deal with, are placed in the *uppermoſt Space* of the ſaid *Table*, and the *Doſes* fit for ſuch and ſuch Perſons, put directly under them in the ſame *Column*.

2. *Note*, That there are three ſorts of *Doſes* of every particular *Preparation*, that is the *leaſt*, *middle*, and *higheſt Doſe*, under every ſort of *Men* or *Women*, which are alſo of three ſorts, the *ſtrong*, *midling*, and *weak*, as you ſee in the *upper Space*.

3. *Note*, (therefore) That when you are about to give an *Opiate* to any *Man* or *Woman*, that you firſt look in that upper Space for the ſort of Perſon you are to give it to, as *weak*, *ſtrong*, or *midling Men* or *Women*: Then carry your *Eye* down in that *Column*, till you come over againſt the *Preparation* that you intend to give; and there you'll find in the ſaid *Column three ſorts of Doſes*; the *loweſt* on the *left Hand*; *the higheſt* on the *right Hand*; and the *moderate Doſe* between them.

As ſuppoſe you are about to give a *middle Doſe* of the *Liquid Panacea* to a *ſtrong Man*; ſee for (*ſtrong Men*) in the *upper Space*, and for *liquid Panacea* in the *firſt Column* on the left Hand; under the Word (*Opiates*) and where the *Column* that belongs to *ſtrong Men*, and the *Space* that belongs

to *Liquid Panacea* do meet, there you'll find, *gt.* 20——30——40 for the *leaſt*, *middle*, and *higheſt Doſe*; give which you think fit, according to your *Intention*.

So if you are about to give the higheſt Doſe of the (*ſolid Panacea*) to a *ſtrong Woman*, you'll find under the Words (*ſtrong Women*) over againſt (*ſolid Panacea*) *gr.* i——*gr.* iſs——*gr.* iſs) which ſhews you, that *gr.* iſs is the *higheſt Doſe* for a *ſtrong Woman*, and ſo of all the reſt.

4. *Note*, That I have been ſo cautious in doſing all the *Opiates*, that you may very ſafely give the higheſt Doſes to all, but very weak Perſons; to whom it is hardly fit to give any Thing, by reaſon of extream *Weakneſs*.

5. *Note*, That if you give any to *young Perſons*, under the *Age* of 20. you ſhould proportion the *Doſes* not ſo much (as idle *Cuſtom* directs) according to their Years, as *Bulk* and *Strength*.

For *Inſtance*, allowing *ſtrong Men* to be 200 *pound Weight*, you muſt give a *ſtrong Youth* of 100 *Pound Weight*, *Half* the *Doſe* of the *ſtrong Man*, and ſo of all other, only allowing ſomewhat leſs the younger they are, becauſe of the *Softneſs*, *Fineneſs* or *Laxity* of their *Texture*; eſpecially if they be very young, to whom *Opiates* muſt be cautiouſly given; or only *Diacodium* (which is beſt in that Caſe) and that in a ſmall Proportion alſo; for young Children cannot bear *Opiates*, as well as grown *Perſons*, no not in Proportion to their *Bulk* or *Weight*.

Place this between p. 294, and p. 295.

A Table of the *DOSES* of the Beſt and Safeſt *OPIATES.*

OPIATES.	Doſe.	Doſe.	Doſe.	Doſe.
Liquid.	*To ſtrong Men,*	*To midling Men, & ſtrong Women,*	*To weak Men, & midling Women.*	*To weak Women.*
The liquid Panacea	*gt.*20——30——40	16——23——30	12——18——24	10——15——20
Laudanum liquidum Cydoniatum	*gt.*20——30——40	16——23——30	12——18——24	10——15——20
Sydenham's Laudanum	*gt.*20——30——40	16——23——30	12——18——24	10——15——20
Diacodium (or *Syr. e mecon.*)	℥i——ʒx——ʒß	ʒß——ʒvi——℥i	ʒß——ʒv——ʒvi	ʒiii——ʒß——ʒv
Solid.				
The ſolid Panacea	*gr.*i——iß——ii	*gr.*i——i¼——iß	*gr.*ß——i——i¼	*gr.*ß——¼——i
Wedelius's Laudanum	*gr.*i——iß——ii	*gr.*i——i¼——iß	*gr.*ß——i——i¼	*gr.*ß——¼——i
Le Mort's Extract	*gr.*i——iß——ii	*gr.*i——i¼——iß	*gr.*ß——i——i¼	*gr.*ß——¼——i
Dr. Bate's pacifick Pill	*gr.*ii——iiß——iii	*gr.*i——iß——ii	*gr.*i——i¼——iß	*gr.*ß——¼——i
Starkey, or *Matthew's Pill*	*gr.*vi——ix——xii	*gr.*v——vii——ix	*gr.*iv——vi——viii	*gr.*iii——iv——v
Philonium Romanum	ʒß——ʒii——ʒi	ʒi——ʒß——ʒii	*gr.*xviii–xxiv——ʒß	*gr.*xvi——xx——xxiv

A Table of the DOSES of the Best

OPIATES.	Dose.	Dose.
Liquid.	To strong Men.	To middling Men, & strong Women.
The Liquid Panacea	gr. 20 — 30 — 40	16 — 25 — 30
Laudanum liquidum Cydoniatum	gr. 20 — 30 — 40	16 — 25 — 40
Sydenham's Laudanum	gr. 20 — 30 — 40	16 — 25 — 30
Diacodium (or Syr. [illegible])	℥i — ℥ii — ℥iii	℥ß — ℥vi — ℥i
Solid.		
The solid Panacea	gr. i — iß — ii	gr. i — i ß — iß
Hoffman's Laudanum	gr. i — iß — ii	gr. i — i ß — iß
Le Mort's Extract	gr. i — iß — ii	gr. i — i ß — i
Dr. Pearce's pacifick Pill	gr. ii — iß — ii	gr. i — iß — ii

CHAP. XXVIII.

The Cure of the ill Effects of Opium.

HAving ſhewn how to prepare *Opium*, ſo as to render it ſafe and innocent in a *Moderate Doſe*, and how much that *Moderate Doſe* is, one may be apt to think that this *Chapter* is needleſs; but when you conſider how many there are that may be negligent, wilful, want Time, Skill, *&c.* to prepare it, or take too much, or too long of it, and that the *Phyſician* muſt be able to Anſwer and Remedy all ill Accidents that may happen, you'll find it very requiſite that I ſhould ſhew how to cure the ill *Effects* of *Opium*, which proceed either,

1. From *its Roſin at Stomach*; Or,
2. From *too much Relaxation by an Exceſſive Doſe*; Or,
3. From *a long and laviſh Uſe of it*; Or,
4. From *a ſudden leaving it off*, after a long and laviſh Uſe thereof.

I. *To Cure the ill Effects of the Roſin at Stomach, you are,*

Firſt, To know whether that be the Cauſe; which you may learn,

1. By conſidering whether *Crude Opium*, or ſome *reſinous Preparation* thereof, was taken, eſpecially by it ſelf, in the *Form* of a *Pill* or *Pills*, as an *Extract* thereof out of *Spirit* of *Wine*, or *Pil. e Styrace*, or *London Laudanum*, or the like, not duly prepared, as has been directed.

2. By the *Symptoms*, which are these, *viz.* a *Nausea*, *Puking*, *Vomiting*, *Hiccough*, *Convulsions*, *Distresses*, and *Anxieties* about the *Stomach*, particularly the Part call'd the *Pit* of the *Stomach*, *Swimmings* in the *Head*, *Vertigo's*, *Palpitations* and *Tremblings* of the *Heart*, *Agitations*, *Uneasiness*, a *Turbulent Pulse*, and (after a Struggle of *Nature* under those *Symptoms*) *Faintings*, *Leipothymies*, *Syncopes*, *&c.* which last you must not take for certain *Signs* and *Symptoms*, unless the former have preceded them, because it is not impossible but they may happen from the *Quantity* of the *Opium*, Condition, or Constitution of the Person, *&c.* but this (when all Things are compared together) will be easily Judged of, especially if you observe;

1. *Whether* those *Faintings* or *Leipothymies* be not more like the *Failures* and *Stupors* of *Drunkards*, than bare *Faintings*; if they be of the first sort, then do they proceed from an over-*Relaxation* occasioned by the *Opium*, and not from its *Rosin*, the Cure of which belongs to the *second particular*.

2. *Whether* they are more attended with the Signs of *Relaxation*, as *Deadness of the Eyes*, *Faltring* of the *Tongue*, *Darkness* before the *Eyes*, *Dilatation* of the *Pupilla*, *Efflorescence* of the *Skin*, *Laxity* of the *Limbs*, *Want of Feeling*, *Stupidity*, *Sleepiness*, *Failure of the Senses*, or of *making Water*, *loss of Memory* or *Understanding*, a *dry Mouth*, a *slow* and *wide Pulse*, and other Things much like the State of a *deadish Drunkenness*; for then those *Failures* are the *Effect* of *Relaxation* by the *pleasant Sensation* that the *Opium* causes.

But after all, it is the *sort of Opium* that was taken, and the first *Symptoms* of a *Nausea*, *Vomiting*,

ing, &c. are most to be depended upon, for it may happen sometimes (as after a great *Dose*) that the *Rosin* may stick, *&c.* and the *Relaxation* be excessive also.

Secondly, When you are satisfied, that it is the *Rosin* at *Stomach* that causes the Mischief, and not bare *Relaxation*, you are not to *promote* or *stop* the *Vomitings*, lest in the *first Case* you torment and endanger the *Person* to no *Purpose*, for the *Rosin* does generally (if not always) stick too fast, and too little in *Bulk* to be shaken off by *Vomiting*, or the *Contraction* of the *Stomach*, as appears by the tidious *Vomitings* that happen thereupon, and the Nature of the Thing; so that (I believe) it is seldom or never carried off that *way*, and that when *People* are at last relieved, it is by a gradual *Waste*, *Dissolution*, or *Digestion* of the *Rosin*, as in great measure appears also by its *Purging* some Persons after *Vomiting*, and a *long time* after it is taken in a *considerable Quantity*. *Nor* are you to *stop the Vomiting*, as not knowing what *Nature* may Advantage her self thereby, but indeed it is more than you can do, generally speaking, (if not always) while the *Rosin* teazes, urges, and stings the *Stomach*.

It evidently follows, that the *Cure* must consist in the *Dissolution* of the *Rosin*.

For this Purpose you have Four Effectual *Dissolvers* of the Rosin, (as you may observe from the *Chapter of the Preparations of Opium*) *that may be used with safety in a Moderate Dose*; 1. *Lixivial Salts*, whereof the best is *Salt of Tartar*. 2. *Sulphureous Spirits*, whereof the best is *high rectified Spirit of Wine*. 3. *The Yolks of Eggs*, whereof the best is the *Yolk of a rear new laid Egg*. 4. *White*

4. *White Soap*, or rather the *Sapo Tartareus*. With these judiciously used, you may (by Gods Blessing) Relieve and Cure the Person grieved with the *Rosin* (or noxious Part) of *Opium*.

1. Give with all possible speed *One scruple of Salt of Tartar*, in a Spoonful or two of *Brandy*, or some other *hot Cordial Spirit*, (if Spirit of Wine be too hot) placing the Person in the very same Posture that he was in when he took the *Opiate*, that it may fall directly upon its *Rosin*, which most probably sticks where the *Opiate* first fell upon the *Coat* of the *Stomach*; then stay for a Minute or two, and give a Spoonful or two of the Brandy or Cordial, with (if need be) the Salt of Tartar in it.

If you find Cause, either because the first *Doses* were Vomited, or that the Quantity of the *Rosin* was great, or that the *Person* grows worse, you may often repeat it, for we must not be sparing in safe Things in dangerous Cases, I think it may well be repeated after every Vomiting *toties quoties*.

I have a great *Opinion* of the *Yolk of an Egg* in these *Cases*, not only because it does (as the other Things) mix with the *Rosin*, but because being of a good Consistence, it sticks to it, and fastens upon't the better, and is not so clearly shaken from it by every *Vomit*, as Liquids are; therefore I think it very Useful to be given now and then immediately after *Vomiting*; however, let no other Food be given but it, and be sure to use it when you have not the aforesaid *Things*, I believe it will be found by *Experience* (which is yet much wanted, because it has not been used) to be the very best *Help* in these Cases, for the afore-

aforesaid *Reason*, and because its fine Oilyness will correct the *Volatile Salt* of *Opium*. I cannot imagine but *White Soap*, or rather the *Sapo tartareus*, (if you have it by you) may be of very good use to dissolve and carry off the *Rosin*.

2. When the *Vomiting* begins to cease, you must distinguish well whether it be because the Person is better, and the *Stomach* discharged of the *Rosin*, or because tired *Nature* yields it self to Rest, by a sort of *Succumbency* to the *Fatigue* or *Languishment*.

You may easily distinguish these Cases; for in the *first Case* every Thing seems better, and in the *last* worse, saving that the *Vomiting* ceases, which was an endeavour of more *vigorous Nature*, and therefore its failing is now an ill *Sign*.

In this *Case* good Old *Wine*, and *Spirituous Cordials*, which may rowse and invigorate *Nature*, and also engage with the *Rosin* by their *Sulphureous Spirit*, must be of excellent *Use*.

Note, That if you want *Salt* of *Tartar*, other *Lixivial Salts* may serve, as those of *Wormwood*, *Broom*, *&c.* only you must give at least One *Third* more; and in Case of great Haste and Urgency, you may give the very Ashes of *Wormwood*, *Broom*, or any Vegetable, in 2 or 3 times the Quantity as the Salts are to be given, in 2 or 3 *Spoonfuls* of *Brandy*, or a *Glass* of *Old Wine*, or both mixed together, for the very roughness of the *Ashes* will, in some measure, contribute to wear off the *Rosin*, and thereby assist the *Lixivial Salt* that is in them.

3. If

3. If the Quantity of the *Resinous Opium* was great, it will be convenient, when you perceive the *Vomiting* begin to abate, to give as much of *Daffie's Elixir*, or *Tinctura Sacra* made in some Spirituous Liquor, as does usually give Six Stools; it is best *Purging* with a Liquid, because speedier in *Operation*, and that it should be *Spirituous*, to help the *Dissolution* of the *Resin*.

1. *Note*, That you also take *Care* not to be too busie with *Spirituous Liquors* when they are much relaxed, and have such *Symptoms* as Drunken People have, especially if they appear in a high *degree*, for too much of them may promote the *Relaxation*.

2. *Note*, That in *Faintings* or *Leipothymies* after such *Vomitings* and *Struggle* of *Nature*, you must not so much excite them by *grievous Sensation*, as *pinching*, *pricking*, *&c.* (for those *Leipothymies* are (as was said) a sort of *Recruit* as *Sleep* is, and therefore the last *Refuge* of *Nature* for that *End*) but with *Spirituous* and *Comfortable Things*, as knowing that there is an awaking by *Recruit*, (which is Natural) as well as by *grievous Sensation*, which is forced and unnatural (as has been shewn.)

II. *To Cure the Effects of too much Relaxation* by an excessive Dose, *&c.*

First, You must be satisfied, that the *ill Effects* thereof are from too much *Relaxation*.

1. By considering the *Preparation* of *Opium* that was taken, for if you find that it was such as had the *Resin* duly separated from it, you may be sure

ſure, that the *ill Effects* are only from *Relaxation*, becauſe the *Doſe* was too great; or if it was a Preparation that had the *Roſin* ſo ſubdued or altered, as you find directed to render it ſafe, you may preſume the ill *Effects* are from over-*Relaxation*; for ſuch *Preparations* are otherwiſe ſafe and innocent, *except* when the *Largeneſs* of the *Doſe* (as that of good *Wine*) cauſes too much *Relaxation*.

2. By the *Symptoms*, which are theſe, *viz. Alienation of the Mind, Loſs of Memory, Stupidity, Sleepineſs, Sopor, Failures* of the *Senſes*, as *Darkneſs* of the *Eyes*, ſeeing Things *double*, various *Colours before the Eyes, Loſs of Feeling, Eaſe from Pain, &c. Deadneſs of the Eyes* to the View, *Dilatation of the Pupilla, Efflorescence* of the *Skin, Laxity* of the *Lower Jaw, Intumeſcence*, and *Laxity* of the *Lips, Faltring* of *the Tongue, Sardonick Laughter, Laxity* and *Weakneſs* of all *Parts*, a *general Ineptitude* to *Motion, Failure* in *making Water, going to Stool*, and in all Things that require *Strength, Contraction, Motion, &c. Difficulty of Breathing*, a *wide* and *ſlow Pulſe*, a *Condition* in general very like that of *Drunkenneſs*, which alſo proceeds from *Relaxation*.

Secondly, When you are ſatisfied that *Relaxation* is the Cauſe, uſe all Means to procure a due *Contraction* of all Parts; which is to be done,

1. By removing the Cauſe of the *Relaxation*:

2. By uſing all good Means for *Contraction*.

Firſt, therefore, give a brisk, quick, and ſtrong *Vomit*, both to diſcharge the *Opiate*, and cauſe *Contraction* of Parts by a *grievous Senſation*.

Pro-

Proportion to the *Deadness*, *Stupidity*, or *Sleepiness* of the Person, so as to give it of twice the ordinary Strength of *Vomits* in Case there is great *Danger* from those *Symptoms*, and that they are of a high *Nature*.

After the *Person* has Vomited 3 or 4 *Times*, or so often as that you may judge the *Stomach* well cleared of the *Opiate*, give *Half* an *Ounce* of *Cream of Tartar* finely poudered in thin *Broth*, *Whey*, *Water*, *Small Beer*, or any convenient Liquid, which will correct the *Opiate* if any remains at *Stomach*, turn the *Vomit* to a *Purger* to clear the *Intestines* also, and contribute much to the *Contraction of Parts*, which you must always have in your *Thoughts*, as the ruling *Intention* in this Case. Therefore,

Secondly, You must use *Contractors* all the *Time*, the chief of which are *Cold*, *grievous Sensation*, (or *Pain*) *Terrour*, *Fear*, *Voluntary Motion*, and *Action*, which last cannot be so well used during the *Vomiting*, lest they stop it.

Therefore (especially if the Person be very Stupid) keep him very *Cold*, for he will hardly feel it, nor take *Cold*, because the *Relaxation*, and the Insensibleness of *Grievance* by *Cold*, *&c.* keeps the *Pores* open; let him be (if possible) in some Motion, as *Walking*, *Hewing*, *Sawing*, *Knocking*, *Tugging*, *&c.* the more *violent* it is the better, because it causes more *Contraction* and *Agitation* to prevent *Sopors*; To force him to Motion, (if need be) *Pricking*, *Pinching*, or *Whipping* him about the *Legs*, *&c.* will be of good *Use*, because *grievous Sensation* adds *defensive Contraction* (which is the greatest sort) to that of the *intentive Contraction* by *voluntary Motion*.

These

These Means failing, he should be exposed stark naked to the coldest *Air*, and in desperate Cases thrown suddenly at unawares into *cold Water*; by which Means you cause *Terrour*, *Surprise*, and *Cold*, (which are the highest and most forcible *Contracters*) to conspire to the *Contraction* of Parts; Hence it is that Drunken *People*, who are so from *Relaxation*, become Sober, as in a moment, by that *Means*.

All the *time*, but during the *Vomiting*, let him use *cold Acids* in great Plenty, and very manifestly acid, for they will not only contribute to *Contraction*, but very much correct the *Opiate*; To this End *Juice* of *Oranges* or *Lemmons*, *Verjuice*, or *Water* acidulated to a good *degree* by *Verjuice*, *Vinegar*, *Juice* of *Lemmons*, *Spirit* of *Vitriol*, *Sulphur*, or the like, will be very proper.

Where you have not the Convenience to plunge them into *cold Water*, (as is directed,) dashing or pumping very cold Water, or Water with a Fourth Part of *Vinegar* upon their naked *Bodies*, will be of great Use, especially if surprisingly done, to cause the more *Terrour* and *Concern*.

These Things may be done *more* or *less*, as Cause may require, which must be left to the *Discretion* of the present *Physician*, or Friends and Standers by (in Case there be no *Physician*:) I only Caution, that *Contracters* should not be used too sparingly, and that you should never cease to advance in the *Use* of them till you perceive their good *Effect*, and then to continue them as occasion requires.

Note,

Note, That the Case may well happen, that the *Rosin* may stick at *Stomach*, and yet no Signs or Symptoms appear but those of *Relaxation*, by *Reason* that the Feeling at *Stomach* may thereby be disabled to take any notice of it.

To be sure of this, you have no other *Means*, because the *Symptoms* and Effects of *grievous Sensation* cannot appear, where it is not (for the aforesaid *Reason*) but to examine whether the *Opiate* was a *resinous one*, as *crude Opium*, *Extract* out of *Spirit* of *Wine*, or the like, for then you may conclude, especially if they were given in a *massy solid Form*, as that of *Pills*, *&c.* without severing the Particles of the *Rosin* by other Things, as the *Yolk* of an *Egg*, *&c.* that the *Rosin* may in all Probability stick at *Stomach*, tho' its Symptoms do not appear for the aforesaid *Reason*.

In such a Case the best Advice that I can give is, externally to use all Contracting Means, as is directed, and internally the Means prescribed for *Dissolution* of the *Rosin*, for you'll thereby answer both *Intentions*.

Failure of making *Water* often happens in these *Cases*, which you may generally help by only clapping the *Scrotum* to the cold Chamber *Pot*, or into *cold Water*, and if that will not do, put some *Vinegar* into the *Water*, and that failing, he must be stript, and cold Water pumpt or dashed upon the *Region* of the *Bladder*.

III. *To Cure the ill Effects of a long and lavish Use of Opium.* These *Effects* (as you may easily observe, if you take a *View* of them where they are enumerated in *Chap.* 6.) are either,

1. *From*

1. *From an over-much and habitual Relaxation of Parts*, as *Weakneſs*, *a Moapiſh Diſpoſition*, *Diminution of Appetite*, *Weakneſs of Digeſtion*, *Dropſies*, *Weakneſs of Memory*, *&c.* Or,

2. *From Acrimony*, as *frequent Irritations to make Water*, *Priapiſms*, Erections of the *Penis*, fruitleſs Inclinations to *Venery*, *&c.*

In this *Caſe* (as in that of old *Drunkards*, which is much the ſame) there is no good to be done till the *habitual Cauſe* is removed, *viz.* the *Taking* of *Opium*, which ſuddenly to leave off is (as was ſhewn) very dangerous. Therefore, in order to leave it off ſafely;

1. You muſt ſtop your Hands, and not increaſe the *Doſe* that is taken, by which Means it will come gradually to have little or no *Effect*.

2. When you find that it is come to that paſs, your Work is half done; then only leſſen it 100th Part every *Day* till you come to take none at all.

3. If during this *retrograde Courſe* you find any *Faintneſs*, drink a *Glaſs* of good Stomach-Wine *toties quoties*, as *Gentian*, or *Centary Wine*, or the like, made by Infuſion in *Claret*; or, if you want ſuch, a *Glaſs* of the *Claret* it ſelf; which Things will excite the *Spirits*, and help *Digeſtion*.

4. When you have quite ended the Taking of *Opium*, continue to Uſe ſuch *Wines* when you are faint, and every Morning take in a *Glaſs* of *Gentian Wine* Two Drams of the *Chalybeate Wine* deſcribed in the *London Diſpenſatory*, increaſing about a Scruple every *Day* till you come to *Half* an *Ounce*, which take for Two Months at leaſt, afterward decreaſing, as you encreaſed, till you come to One *Drachm*, and ſo give over.

But if you find *Occaſion*, you may continue that Courſe longer, or as long as your *Phyſician* thinks fit.

After all, you may uſe a *Glaſs* of *Claret* when faint, but be ſure to be moderate, and not run from one *Exceſs* to another.

As for the *Acrimony* of *Bloud*, that is more during the *Taking* of *Opium*, and will ſoon after gradually wear off, eſpecially by the Courſe directed; if not, *Camphire* is the *adequate Remedy*, of which with equal Parts of White *Roſin*, and *q. ſ.* of Mucilage of *Gum. Tragac.* you may make *Pills* of 5 *Grains* weight, taking 4 of them every Night at *Bed-time* in a rear *Yolk* of an Egg, as long as it is neceſſary; for *Camphire*, by its fine *Sulphur*, corrects the *volatile Acrimony* of *Cantharides*, *Opium*, *&c.* and ſo allays *Titillation* to *Venery*, *&c.* as is obſerv'd.

IV. *The ill Effects of a ſudden leaving off of Opium*, as *Anxieties*, *Diſtreſſes*, *Depreſſions of Spirits*, which (as was ſaid) are very dangerous, are remedied no other *way*, but either,

1. *By returning to the Uſe of Opium*, which is a moſt certain *Cure*, and afterward (if you pleaſe) give over the *Uſe* of it after the manner that I directed, which you'll find to be ſafe; nor can I adviſe you to truſt any other *Method* of leaving it off, unleſs it be,

2. *By ſubſtituting Wine inſtead of Opium*, which is not quite ſo *ſafe* or *certain*; your beſt *Method* of uſing it, is to drink a good *Glaſs* of it ſo often as to keep the Comfort thereof at *Stomach* continually, that ſo it may anſwer the more *permanent Effect* of *Opium*, and keep you from a *faint Condition*;

dition; but ſeeing alſo that this Courſe is not convenient to be continued long, you muſt gradually leſſen the *Doſe* of this, as you are directed to do that of *Opium*, till you come to take none, or (at leaſt) a moderate and wholeſom Quantity.

Note, That if ſuch as uſed to take *Opium* are even almoſt expiring for *want* of it, you muſt, to prevent imminent *Death*, give a *Liquid Preparation* thereof to the *value* of what the Perſon was uſed to take, in a *Cordial Vehicle*, as *Spirit* of *Wine*, *Brandy*, or the like, becauſe ſuch hot *Spirituous Vehicles* do (as has been ſhewn) immediately give ſome Comfort by actuating and warming *our Spirits*, till the *Opium* comes to Operate, which will not be long, becauſe it is in a *Liquid Form*; if you find the Perſon ſink notwithſtanding, he may be kept up by repeating the *Brandy* or *Cordial* without any *Opium* in it, till the *Opiate* operates, which will certainly (by *God's* Help) ſet him right, in caſe it does but begin to operate before he is dead. See *The Philoſ. Tranſact. for June, July, Auguſt*, 1696.

Note, That it is a very *falſe Imagination* that *Authors* have of the *Turks* Capacity (by *Nature*, *Climate*, or the like) to take more *Opium*, or in greater Quantity than we may, but that they make more *Uſe* of it, and by that means come to take 2 or 3 *Drams* a *day*; for they begin with ſuch ſmall Quantities as we commonly give, till by a long Cuſtom of taking it they come to take the *ſaid Quantities*, which is but ſmall in Compariſon of what ſeveral *Engliſh* People that have been uſed to it do, or have taken, as I could Name ſeveral to you, if I had not *Reaſons* to the *contrary*; however, I am at Liberty to tell you the Quantities, tho' I muſt forbear naming the *Perſons*

ſons; ſome have daily taken 2, 3, 4, 5, 6 *Drams*, nay, I have heard of ſome that have taken an Ounce a Day, and of One that took *Two Ounces*, whereas the Learned and Curious Dr. *Edward Smith*, could find none about *Smyrna* who took above 3 *Drams* a Day.

All this is moſt agreeable to Reaſon, and the whole Current of my *Diſcourſe*, *viz.* That it can be better born in *cold* than *hot Weather*, and conſequently in *cold* than *hot Climates*; by *firm* Fleſhed Perſons, than ſuch as have *ſoft* and *flaccid Fleſh*, as the *Southern* People have in Compariſon of the *Northern*, and ſuch as inhabit *cold Countreys*. Therefore you may be ſure that ſuch as Enquire into the Cauſe, why the *Turks* and other *Eaſtern People* can take greater Quantities than we can, ſeek for the Reaſons of Things before they know the *Fact*, nay, when the *Fact* is *quite contrary* to what they build upon; We may as well expect *Edifying Diſcourſes* from them that Enquire why Fire is cold? Water dry? and the like, as from ſuch as ſuppoſe Things contrary to true and ſenſible *Experience*.

CHAP.

CHAP. XXIX.

Some general Rules, Cautions, &c concerning the Uſe of Opium.

THo' there is hardly any *Rule*, *Caution*, or Thing worthy of *Obſervation*, concerning the *Uſe* of *Opium*, but what is implied, or eaſily inferable from what has been ſaid; nor, (now that the true Nature of *Opium* is diſcovered) can there be ſuch *Fears* and *Jealouſies* (which multiply *Cautions*) concerning the *Adminiſtration* thereof; (for every one may now eaſily ſee wherein its *Danger* and *Benefit* lies) yet becauſe a *Chapter* of *Rules* and *Cautions* may be expected, as being uſual, and to have a *ſingle View* of ſuch as lie more ſcatter'd, and not ſo readily found in the *Body* of the *Book*, I will, to introduce the *Uſe of Opium* with more *Clearneſs* and perfect *Security*, give you a *Collection* of *general Rules* and *Cautions* concerning its *Uſe*; whereof ſome are mentioned, and moſt inferable from the *Premiſes*.

I. As to its *Subſtance*.

1. It ſhould be always given, freed from its Reſinous Parts, if you can get ſuch a *Preparation*.

2. It is alſo neat and convenient, that it ſhould be freed from all its *Earth* and *Dreſs*.

3. Never give *Opium*, but either ſo prepared, or with its *Reſin* ſo ſubdued, ſegregated, or altered, as I have ſhown in the ſafe *Preparations* thereof. It follows that,

4. *Crude Opium*, and *Extracts* made in *ſulphureous Spirits*, are utterly to be rejected.

5. Never give it mix'd, or join'd with *reſinous Things.* (as has been intimated.)

6. Never mix, or join it with other *Opiates*; 1. Becauſe none of them are ſo good. 2. Becauſe they are not ſo well known. 3. Becauſe it makes the *Doſe* more uncertain. 4. Becauſe thoſe other *Opiates* are uſed unprepared.

7. *Pil. e Styrace*, becauſe made of *reſinous Opium*, join'd with *reſinous Things*, as *Styrax calam.* and *Olibanum*, is an *inſufferable Preparation*, (tho' commended) and therefore has frequent ill *Effects*, to my *Knowledge*.

8. *Pil. e Cynogloſſâ* is ſuch another, having two *Opiates* in it beſides *Opium*, extracted out of Spirit of Wine, (which is far worſe than *crude Opium*, tho' by the way of *Eminence* call'd *Opium prepared*, in our *Diſpenſatory*) *Styrax calam.* and *Olibanum*, which are *reſinous*.

9. *Laudan. Lond.* is alſo an ill Preparation, as having the *Opium* extracted out of *Spirit of Wine* to make it worſe than when *Crude*; therefore has ſometimes ill *Effects*, eſpecially when uſed alone in the *Form* of a *Pill*, in a large *Doſe*, (as was ſaid.)

10. *Philonium magiſtrale* is alſo to be rejected, becauſe the *Opium* is prepared in *Spirit of Wine*, and *Benjamin* added, which is *reſinous*.

11. *Philon. Rom. & Perſic.* are tolerable, becauſe the *Opium* is diſgregated, and mix'd (as *Galen* would have it) among much, and ſeveral other Things, which keeps it's *reſinous Parts* from *Coaleſcence*.

II. As to its *Form*.

1. *A Pilular Form* of *crude Opium*, or any *reſinous Preparation* thereof, wherein the *Roſin* is not duly ſubdued, ſegregated, altered or corrected, is (as has been ſhown) the moſt pernicious.

2. The

2. *The Form of an Electuary* is commendable; 'tis in ſmall *Quantity*, mix'd therein with many or much other Things, that prevent the *Coaleſcence* of the *reſinous Particles*.

3. A *liquid Form* is generally good, becauſe the Parts, as in a Tincture of *Opium* in *Spirit* of *Wine*, are ſevered, and ſegregated; yet it is not ſo very ſafe, where the *Reſin* is not ſeparated; becauſe if Care be not taken (as has been directed) the *reſinous Particles* may be precipitated at *Stomach*, and ſo *coaleſce* and ſtick to it.

4. The Operation of *Opium* is quicker in a *liquid Form*, but more laſting in a *ſolid Form*, eſpecially if the *Opium* be *reſinous*; which, tho' noxious in general, yet has the *Advantage* of *Duration*, where it may be born, as in Perſons of a *robuſt Texture* and *good Digeſtion*, or where Cuſtom has taken off it's Grievounſeſs, as you find in habitual *Tobaco-taking*, &c.

5. The *liquid Panacea* of *Opium*, is better for *Alteration*; becauſe it is the firſt Fruits of the *Opium*, and more ſincere and unaltered by *Fire* than the ſolid. But,

6. The *ſolid Panacea* is better, where a ſtay at *Stomach* and the Inteſtines is convenient, as in ſtopping of *Vomiting*, *Looſeneſſes*, &c. To be brief,

7. *Liquid Forms* ſhould be always given in foul *Stomachs*, where the *Digeſtion* is weak, in *Feavers*, and when a nimble Operation is requiſite.

III. As to its *Doſe*.

1. *The mean* or *middle Doſe* is generally to be uſed; and where there is no *Direction* to the contrary.

2. *The mean Doſe* may ſerve, *except* in *violent Pain*; or where much of the *Opiate is loſt*; (as it happens very often in *Vomiting* or *Looſeneſs*) or to

excite *Venery*; becauſe thoſe Parts are remote, and require a very *ſenſible Titillation*. But as to theſe matters, you'll have *particular Directions* in the *reſpective Caſes* in the following *Chapters*, that treat thereof in a *ſpecial manner*.

3. The *Doſe* muſt be proportionably leſs in the *fine* and *lax-textured Children*, *Women*, *warm* and *moiſt Weather*, *weak Stomachs*, *Perſons* much *debilitated*, or *over-tired* with *Work*, *Labour*, *Diſeaſe*, &c.

IV. As to its *Vehicle*.

1. It ſhould generally, (unleſs there be particular Cauſe to the contrary) be pleaſant and agreeable to the *Taſte* and *Stomach*, that it may rather conſpire with the *Opiate* to pleaſe the *Membranes*, &c. than contradict the *Senſitive Pleaſure*, that it cauſes.

2. It ſhould not be an *Acid*, becauſe it infringes the *volatile Nature* of *Opium*, except ſome particular Caſe requires it; which will be ſeen hereafter.

3. It ſhould not be a *Volatilo-ſaline*, eſpecially to cauſe *Sleep*, or becauſe that may render it too acrimonious or pungent, and ſo hinder *Sleep*, *Compoſure*, &c.

4. It ſhould not be *lixivial*, becauſe its fixed Nature oppoſes the *volatile*; *except* it be, where the *Opiate* is *reſinous*, to help it's *Diſſolution*. Therefore,

5. *Wine*, or *fermented Liquors*, *Cordials*, *Waters*, or ſmooth and pleaſant Liquids, as *Emulſions*, *Milk* and *Water*, Water and Sugar, *&c.* will be the moſt proper (generally ſpeaking.)

6. The *reſinous Opiate* ſhould be always given in *ſulphurous Spirits*, *Wine*, or *ſtrong Liquors*, or in a *lixivial Vehicle*, or rather in both mixed; or in a *raw Yolk* of an *Egg*, or finely poudered and well mixed with *Electuaries*, *Bolus's*, *Conſerves*, *thick Syrups*,

rups, *Pulps*, or any *Thing* that is innocent, and of a good Conſiſtence, to keep the *reſinous Particles* aſunder, and to prevent their *Coaleſcence*; for which *End*, I judge, that good white *Soap* muſt be (becauſe of the *Alkali*, its *Slipperineſs*, and *Aptitude* to join with the *Roſin*) a good *Vehicle*, the *Opium* and ſcrapings of the *Soap* being mixed with a little *Roſe-Water*, (and what elſe you think fit, to render them more acceptable) by pounding them in a *Mortar* for a good while, to an intimate mixture.

V. As to *Time*.

1. Give the *Liquid Forms* half an Hour at leaſt, or an *Hour*, before the *Time* you would have them operate.

2. Give the *ſolid Forms* an *Hour*, or an *Hour* and a *half*, before you would have them operate.

It is very ſilly, not to give them till the very *Time* that they ſhould operate, as 'tis uſual at Bed-time, when they ſhould be then operating, and cauſing *Sleepineſs*, that the *Reſt* and *Eaſe* of lying down may concur with it; whereas if People are unapt to *ſleep*, (as generally they are who take *Opium*) they, not taking it till Bed-time, lie toſſing and tumbling, grow uneaſie, and reſtleſs, and the Bed hard, and (in a great part of the Year) too Hot, before the *Opium* operates, ſo that the *Opium* cannot take Effect, by *Reaſon* of *Diſquietudes*, ſo the *Perſons* lie all or moſt *Part* of the *Night* without any *Sleep*; whereas if it be ſo given as to cauſe a great *Sleepineſs* by the *Time* they go to Bed, their lying ſtill a very little Time (which they are then apt to) and the Bed being ſoft, eaſie, cool, and pleaſant, they immediately ſleep, and their Spirits being compoſed, continue their *Sleep* all, or moſt *Part* of the *Night*. Therefore I have often come where People had not ſlept, tho' they took an *Opiate* at Bed-time, and given them the very ſame a convenient Time before, and they have ſweet-

ly

ly slept, to their Heart's *Desire* and *Refreshment*.

4. Give *Opiates*, as to Meals, at least 3 *Hours* before and after them, or about the middle Time between them, if it be in the *Day-time*, or when the *Stomach* is near empty, or but little or light matter in it; which if gentle and agreeable, will help Men to *sleep*: But great *Repletion* and perfect *Emptiness* or *Hunger* (which is a *grievous Sensation*) do disturb or hinder *Sleep*.

5. *Opiates* may, and have proved inconvenient *before* or *after Letting of Blood*, and *Hemorrhages*, especially if the *Evacuation* was large, and sudden; the *Reason* is, because the Persons being very dispirited, and so much inclined to *Sleep* of themselves, may sleep too much and dangerously; and because *Opium* relaxing hinders the *Vessels* duly to contract upon the remaining *Blood*, which may cause a *Discontinuance* of its Streams, by *Reason* that the diminished *Blood* may not suffice to fill up the relaxed *Vessels*; tho' this may seldom happen, because the *Compressure* of the *Air* is appointed by most wise *Providence* to close all our *Vessels* in such *Cases*; but it must be better done, when the Parts themselves do also duly contract, which *Opium* hinders.

6. You have much the same *Reason* not to give them soon after other large *Evacuations*, where a due *Contraction* of the Parts is requisite; as after Tapping. (or *Paracentesis*) in *Dropsies*; *Childbirth*, &c.

7. *Opiates* are best given in the Morning, to cause *Euphory* or *brisk Effects*, because the *Refreshment* gain'd by the Night's *Sleep* does not only concur towards *Euphory* and *Bruskness*, but also much oppose *Sleepiness* and *Drowsiness*, which are not consistent with *brusk Effects*.

VI. As

VI. As to *Persons.*

1. It is not convenient to give *Opiates* to Persons *very young* or *very old.*

2. They agree better with *Men* than *Women* or *Children*; With Men of a robust and hard, rather than of a weak, fine, tender, and soft *Texture*; with such as have a *strong Digestion*, than a weak; and in *general* with the *strong*, rather than the *weak.* Therefore,

3. Never give them to *Persons* that are very weak, especially if they take, or digest no *sustenance*, or extreamly little, for Reasons already given; nor to such as are near their *End*, or almost expiring; ☞ *Except* it be for *want* of *Opium*, or by *Extremity* of *Contraction* by *Terrour*, *Pain*, *Cold*, *Convulsions*, &c. for then it will do *Wonders* in preserving People, that are otherwise past all *Hopes*, by relaxing, taking away *Pain*, *Contractions*, &c.

4. It is not so agreeable to the very *fat* or *moist*, because they may be over-relaxed; nor to the very *lean*, and *dry*, &c. (especially to cause *sleep*) because it is apt to irritate and actuate their Spirits too much, by which means *Sleep* is much hinder'd.

VII. As to *Maladies*, and *Diseases*, &c.

1. *Opiates are not convenient* in *Relaxations*, as such; as *general Palsies*, *Hemiplegia's*, *Palsies* of the *Eyes*, *Deadness* of them, *Dilatation* of the *Pupil*, *Relaxation* of the *Tympan* of the *Ear*, of one *side* of the *Face*, which makes the other *side* contract, and and so draw the *Face* awry; for 'tis not a *Spasm* or *Convulsion* (as Men imagine) of the contracting side, but a *Resolution* of the other, which permits

mits the *Antagonists Muscles* of that side to contract without *Opposition*, and draw the Face toward the strong or sound *Side*: *Relaxation* of the *Uvula*, or the annex'd *Valvæ*, (which last is known by Snuffling without any other evident Cause, or by observing that it does not shut in sounding *u*, (in *but*, *cut*,) &c. by it self; *Relaxation* of the *Larynx*, and *Windpipe*, (which is known by a hoarse kind of *Whisper* without a *Cold*, or any *evident Cause*;) Of the *Pharynx*, or *Gullet*, (which is known by a *Depravation* of swallowing without Pain, or *Tumor*, or any evident Cause;) A *Paralytical Asthma*, or difficulty of Breathing, wherein Men heave the *Shoulders* without any apparent Cause; *Relaxation* of the *Stomach*, as when Meat stays too long at *Stomach*, &c. A *Palsie* of the *Intestines*, or *Guts*, as when one is bound, and cannot refer it to any other Cause; Of the *Bladder* (when one cannot make *Water* without any other Cause to refer it to;) *Relaxations* of the *Sphincters* of the *Bladder*, and *Anus*, (that is, when *Urine*, or *Ordure* fall from one *involuntarily*;) nor are they convenient in *Baths*, unless great *Relaxation*, as for Passage of the *Stone*, &c. is intended.

Nor in *Ruptures* as *Bronchocele*, (of the *Windpipe*;) *Exomphalos* (of the Navel) *Bubonocele* (of the *Groin*;) or the Fall of *Humours*, *Guts*, *Fat*, &c. into the *Scrotum*, or of the *Fundament*, *Womb*, or the *Vagina*, &c. *except* it be to reduce them.

Nor in *Lunations*, *Sprains*, *Laxity* and *Weakness* of *Joints*, *Limbs*, *Back*, &c. *Extensions* of *Nerves*, *Tendons*, *Ligaments*, &c. Nor where *Relaxation does or may improve the Distemper, or do harm*, as in *Apoplectical* and *Soporose Cases*, as *Coma*, *Caros*, *Lethargy*, &c. *Weakness* of *Memory*, *Stupidity*, *Morosi*, *Nightmare*, *Drunkenness*, &c. *Syncopes*, and *Faintings* from *Relaxation*, as the original Cause; as from *Excess of Joy*, *Pleasure*: *Large Evacuations*

when

when the Parts cannot well, and duly contract upon what remains, as after *Child-Birth*; profuse *Hemorrhages*, *Tapping*, (or *Paracentesis*,) or any *large Evacuation* of *Humours* in *Dropsies* of the *Belly*, *Breast*, or *Head*; nor (as has been hinted) in *Dropsies*, tho' without any such *Evacuation*, unless it be upon some special Consideration of the learned; nor in *Tremblings*, or *Shakings* of the *Head*, or *Hands*, &c. from *Weakness*, as in *old Age*: Nor in *Fluxes from Relaxation*, as too much *Sweat*, *Gonorrhœa Simplex*, *Diabetes*, *nocturnal Pollutions*, *Chylous Flux*, *Lientery*, *involuntary Flux* of *Urine*, or *Ordure*, and some sorts of *immoderate Fluxes* of the *Menses*, or *Lochia*, which owe their Cause to *Relaxation*: or *Aptitude* to *Abortion* from that Cause, and indeed generally in *Women* with *Child*, lest it should cause *Abortion* by relaxing the *Neck* of the *Womb*. Or where *Contraction* is beneficial, as to empty a *foul* or *replete Stomach*, *Choler*, &c. by *Vomiting* or *Stool*, or an ill *Humour* any *way*. Therefore

II. *Opiates are not convenient when grievous Sensations are useful*, as to excite *Expectoration* when Matter threatens *Suffocation*, in *Vomicæ*, *Pleurisies*, *Peripneumonias*, *Consumptions*, *Spitting of Blood*, &c. When *Hunger* calls for *Food*, and *Restauratives*; that of *stuffing* at *Stomach* excites *Vomiting*; that of *Urine* solicites us to a due *Excretion* thereof, that of ill *Matter* at *Guts* causes an *Evacuation* thereof; so that when a *Crisis* is to be by the *Help* of *grievous Sensation*, or *Irritation*, *Opiates* are not convenient, for it takes off the Sense of *Irritation*; but when a *Crisis* is to be by *Relaxation*, as by opening the *Pores* to cause *Sweat*, *Perspiration*, &c. then is it of excellent *Use*: So, that *great Question*, (that has very much puzzled the learned) *whether Opium is convenient before a Crisis &c?* is plainly, and *mechanically* answer'd.

III. *Opiates*

III. *Opiates are not convenient* where *Titillation* by the *Acrimony* of *volatile Salts* is the Cause of the *Disease*, as in troublesom *Erections*, *Priapisms*, *Nocturnal Pollutions*, *Venereal Furies*, too much *Salacity*, and *Titillation*, *Itchings* of the *Uterus*, *Scrotum*, *Penis*, *Skin* in general, *&c.*

IV. I scarce need tell any, that *Opiates* are inconvenient when the *Meconium* of Children should be evacuated; or when one is *bound* in *Body*, or apt to be so; but there may be a *Time*, when the *learned Physician* may think fit, to give them even to the *Costive* in *urgent Cases*, for he can order somewhat along with them, or soon after, to open the *Body*; who may also see Cause sometimes to vary from these general *Rules*, when *Necessity* and *good Reason* direct him so to do, tho' they are nevertheless *general* in their *Nature*, and not to be transgressed without *special Cause*, and *mature Deliberation*.

V. *Opiates are not so convenient* where there is much slimy, moist, and phlegmatick Humours, by Reason that the Parts are subject in such Cases to be too much relaxed.

I have been the fuller (especially upon the *Head* of *Diseases*) that I may hereafter have nothing to do, but to shew the *beneficial Use* of *Opiates duly prepared*, more particularly of the *Panacea's* of *Opium*, of which I am going to speak.

CHAP.

CHAP. XXX.

The Method contriv'd to ſhew the Uſe of well-prepared Opiates (more eſpecially the Panacea *of* Opium.)

HAving ſhewn the *Nature* and *Principles* of *Opium*, which produces the good, which the bad Effects; *how* and *why* they do ſo; *how* to ſeparate, ſubdue, and correct the *bad Principles*; the due *Doſes* of good *Preparations*; *how* to *cure* all the ill *Effects* of *Opium*, and *general Rules* and *Cautions* concerning it, and in what Caſes it may not be convenient; I have now nothing to do but to ſhew the *beneficial Uſe* of the *Panacea*, (or well prepared *Opiates.*)

To make it more agreeable to *rational Minds*, and fix its *Uſes* better in *Memory*, I will ſo proceed by its *Effects*, that the very Title of every *Chapter* may imply the Reaſon of its *Uſe*, which is either *internal* or *external*, and both of them either,

I. As it is a *Pleaſer of Senſation*, (or an *Opiate* ſpecially ſo call'd) by which means it produces all the *good Effects* that are notoriouſly obſerved, which are mention'd in *Chap.* 4, 5, 6. *Or*,

II. As it is an *Alterative of the Bloud*, *&c.* which is all Improvement, becauſe almoſt wholly diſregarded, and never brought into any *Method* to this *day*, tho' it is the far nobler *Uſe*, by how much *Curing* excels bare *Pleaſing*, or *Palliating*, tho' theſe laſt *Uſes* have already rendred it the moſt *general Medicament* that is in being, inſomuch that *Sylvius* ſaid, having only reſpect to this Uſe, That he had rather not be a *Phyſician*, than not know the *Uſe* of *Opium*. III. As

III. As an *Evacuative* by relaxing and opening the Pores.

Its *Effects* and *Uses*, as a *Pleaser of Sensation*, are fairly reducible to these *general Heads*, viz.

1. Its *comforting*, *gratifying*, *encouraging*, and *invigorating* of the *sensitive Soul* and *Spirits*.
2. Its *composing* the *sensitive Soul*, *Spirits*, *&c.*
3. Its *relaxing* all the *sensile Parts* of the *Body*.
4. Its *causing Sleep*.
5. Its *causing Indolence*, or taking away *Pain*.
6. Its *stopping Fluxes*, that depend upon *Irritation*, *grievous Sensation*, *Contraction*, *&c.*
7. Its *promoting Fluxes*, that depend upon *Relaxation*.
8. Its *causing Titillation*.
9. Its *causing Vigilancy* (or *Watching*) in some *Persons*.

Its *Effects* and *Uses*, as an *Alterative*, are,

1. To *invigorate Nature*, or the *sensitive Soul*, and *Spirits*, which are the *Principles* of all *Motion* and *Alteration* for the *Preservation* of the *Animal*.
2. To *give Nature*, *or the sensitive Soul*, *an Euphory* in that Work of *Preservation*, *Alteration*, *&c.*
3. To *administer fresh and most agreeable Principles* for that *end*.
4. To *administer such as are more vigorous* and powerful than our own, in order,
5. To *resolve all ill Humours*, as vigorous and agreeable *Menstruums* do.
6. To *compose*, *combine*, *concentrate*, *or unite the good and agreeable Parts of those Humours*, and by its *Agreeableness* to join with them, and cause a strict combination of Parts, to intercede and (as it were) cement them.

7. To

7. To *discuss the separated and effete Parts of those Humours* by its brisk *Volatile Salt.* And,

Its *Effects* and *Uses*, as an *Evacuative*, are,

1. To *cause a liberal Perspiration*, to give those effete Parts their *Exit* in the most natural, plentiful, kind, and universal manner.

2. To *cause Sweat*, when there is sufficient Matter for that end.

3. To *relax and open the Pores for the Menses and Lochia, &c.*

CHAP. XXXI.

Of the Uſe of the Panacea, *or well-prepared* Opiates, *to comfort and invigorate the ſenſitive Soul and Spirits.*

I Have ſhewn *how* and *why* it cauſes a *blithe*, *gay*, and *good Humour*, *Serenity*, *Ovation of the ſenſitive Soul and Spirits*, *Alacrity*, *Promptitude*, *Aſſurance*, *Courage*, *Magnanimity*, *Euphory*, or *eaſie Undergoing of Labour*, *Journeys*, *&c.* It therefore follows,

1. That it muſt *prevent* or *take off Sadneſs*, *Melancholy*, *Cloudineſs*, *Slowneſs*, *Dulneſs*, *Liſtleſneſs*, *Lazineſs*, *Baſhfulneſs*, *Cowardiſe*, *Fear*, *Puſillanimity*, *Laſſitude*, *Diſtreſſes*, *Anxieties*, *Solicitude*, and all ſuch *grievous Paſſions*, as *Wine ad Hilaritatem* does.

2. That by *fortifying the ſenſitive Soul and Spirits*, it muſt *prevent contagious Infections*, and mightily *enable* and *invigorate Nature* to ſubdue and conquer what is inimicous to it in all *Reſpects*.

3. That it *prevents* and *takes off Faintings* and *Leipothymies* that happen from the aforeſaid Cauſes, as thoſe upon *Fear*, *Tenour*, *hard Labour*, being *Plague-ſtruck*, and the like.

I. The *Form* that it is to be given in is indifferent, unleſs a very ſudden *Effect* is required, as may happen in *Fainting Fits*, *&c.* for then (as was ſaid) a *liquid Form* in *Wine*, or *hot Cordials*, is beſt.

II. The

II. The *Doſe* in theſe Caſes muſt be *moderate*, and ſometimes, in great *Caſes*, the *higheſt*; for great *Grievances* cauſe *proportionable defenſive Contraction*, which oppoſes the good *Effect* of the *Panacea*, *&c.*

III. The *Vehicle* ſhould be a Glaſs of *generous Wine*, cordial fermented *Liquors*, *comfortable Spirits*, or ſuch-like; to which you may add (if you pleaſe) *pleaſant* and *comfortable* Things; as, *Tincture* of *Saffron*, or its *Spirits*; *Chymical Oils*, as of *Cinnamon*, *Nutmegs*, *Saſſaphras*, *Cloves*, *&c.* (dropp'd into *Sugar*) *Ambergriſe*, *Muſk*, *&c.*

IV. The *Time* of giving it, is at ſuch a convenient *diſtance* before the Time that you would have it operate, that it may produce its *Effects* at the *Time* deſired. See the *General Rules* as to *Time*.

When it is requiſite to continue its *Effects*, as in long *Journeys*, or the like, repeat it as ſoon as you find the *Effects* of the former *Doſe* begin ſenſibly to decay; becauſe it takes ſome *Time* to operate.

V. The *Regimen*, when *Action* or *Buſineſs* is intended, is to keep in *Motion*, *Diſcourſe*, or the like, leſt you ſleep or grow drowſie.

But when you intend *Sleep*, obſerve the *Regimen* directed in the *Chapter* of its Uſe to cauſe *Sleep*.

Tho' leſs *Suſtenance* will ſerve when you uſe it, yet muſt it not be omitted in a moderate manner.

The *Kind* muſt be ſuch as is eaſie of *Digeſtion*, and apt to promote *Perſpiration*, as *light Bread*, *Mutton*, *Lamb*, *Neat's-Tongue*, *Sweet-breads*, and *Lamb-ſtones*, with agreeable *Sauces* that may help

Digestion and *Perspiration*; which is a great Cause of *Serenity* and *Alacrity*, (as *Sanctorius* observes) because that thereby *Fumes* and *Vapours*, which cloud and clog the Spirits, are evaporated, and the Spirits become serene and expedite.

It is to be observed, That *Parsly*, *Selery*, *Onions*, *Horse-Radish*, *Garlick*, and such *warm* and *volatile Plants*, promote *Perspiration*.

Your *Drink* should be good *Stomach-Wine*, or *Wine* and *Water*, or fine *clear Drinks*, not too new.

1. *Note*, That (as has been intimated) drinking good, acceptable, and generous *Wine*, so often (yet moderately) as to keep a continual Sense of its *Pleasure* at *Stomach*, is the best Substitute to it that can be used; for it will thereby answer much of the *permanent Effect* of well-prepared *Opium*, tho' not quite so convenient in many *Respects*; as, 1. Because it must be so often repeated. 2. Because its Effect is not so fine and charming. 3. Because the *Wine* heats more. 4. Because it washes the *Stomach* too often, and the like.

2. *Note*, That when People are in an untoward Condition, or (as they call it) out of *Sods*, the next *day* after *Drinking*, Men often advise taking the Hair of the same Dog, (that is, *drinking* some of the same *Wine* or *Liquor*) it is best for them to use it as I just now directed; for their Case (upon the good *Effect* of the *Wine* ceasing) is much like that upon the going off of the *Operation* of *Opium*; which may also (in this *Case*) be used instead of *Wine*, to procure a better and blither Condition for that *day*, that uses to be very troublesome to *Drinkers*.

3. *Note*,

3. *Note*, That good *Preparations* of *Opium* may be conveniently uſed to Horſes, to prevent their being tired, or take off their Wearineſs, and cauſe them to go on; but I would not adviſe any Preparation in this Caſe but the *liquid Panacea* in good *Ale* or *Beer*, and that only in the ſame Quantity as is uſed to Men, till farther *Experience* emboldens the *Practice*: By ſuch means, (I cannot doubt it) any *Jade* may be made to appear lively, go well, *&c.*

CHAP. XXXII.

Of the Uſe of the Panacea, &c. *to compoſe the Senſitive Soul, Spirits,* &c.

I Have ſhown *how* and *why* it *compoſes* and *quiets* the *ſenſitive Soul*, *Spirits*, *Bloud*, *Stomach*, &c. and by that means allays all the *Fury*, *Commotions*, *Perturbations*, and *turbulent Exorbitances* thereof, and that often without *Sleep*, but much better with it. It follows therefore,

1. *That it prevents and takes off all Frets and turbulent Paſſions of the ſenſitive* Soul; as, *Anger*, *uneaſie Agitations*, and *Toſſes of the Mind*, *Peeviſhneſs*, *Fretfulneſs*, *Diſcontents*, *Diſquietudes*, *Diſſatisfactions*, *Murmurs*, *turmoilings* and *vexatious Thoughts*, *Anxieties*, *Solicitudes*, *&c.* and all the *evil Effects* thereof; as, *Watchings*, *Waſte of Spirits* or *Strength*, *Laſſitudes*, *Hypochondriacal Melancholy*, *Cachexies*, *Scurvies*, *&c.* But theſe laſt belong moſt properly to its *Alterative Faculty* or *Vertue*.

2. *All involuntary furious Agitations of the ſenſitive Soul and Spirits*; as, *Madneſs*, more eſpecially *Melancholy Madneſſes*, or ſuch as proceed from *grievous Thoughts* or *Apprehenſions*, *Loſſes*, *Croſſes*, *Deſpair*, *Fears*, *Terrours*, or *the like*; but they are not ſo good in *Merry Madneſſes*, as thoſe from *Joy*, *Venereal Fury*, and ſuch-like, which anſwers the great Diſputes about *Opiates* in *Madneſſes*, *Deliriums*, *Epileptical Fits*, *Convulſions general* and *particular*, as thoſe of the *Head*, *Riſing of the Lights*, *Vomitings*, *Hiccoughs*, *Sabbings*,

bings, *Reckings*, *Convulsive Asthma's*, *Palpitations*, and *Tremblings* of the *Heart*, *Shakings* and *Shiverings* upon *Fear*, *Terror*, *Cold*, *Pain*, *Ague-Fits*, *Convulsive Colicks*, *Hysterick Fits*, *Iliack Passions*, *&c.*

3. *All Fevers and Frets of Humours that happen from any of the aforesaid Causes*; *Or* from any *violent Motion*, voluntary or involuntary, as *Labour*, *Running*, *Hewing*, *Fighting*, or any *vehement Exercise*, *Ratlings*, *Tossings*, *Concussions* in *Coaches*, *Waggons*, *Boats* in stormy Weather, *violent Riding*, *&c.* *Or* from *Heat* of *Fire*, *Sun*, *Baths*, *Hot-Houses*, *Bagnio's*, *Crowds*, *lying too many* in one *Bed*, or with too *much Clothes*; *Or* from *grievous Sensation*, *Irritation*, or *Pain*, as *Fevers* upon *Inflammations*, *Abscesses*, *Buboes*, *Stone*, *Colick*, *Cardialgia*, *Wounds*, *Fractures*, *Dislocations*, *Contusions*, *Amputations*, *Lithotomy*, *Paracentesis*, or any painful Operation of the *Noble Art* of *Chirurgery*; *Agony*, or *Pain* of the *Small-Pox*, as its *second Fever*, and the like: *Or* from *Fluxes*, as tedious and turbulent *Vomitings*, *Diarrheas*, *Dysenteries*, *Cholera's*, *Iliack Passions*, *artificial Purging*, and all *symptomatick* or *immaterial Fevers* whatsoever, which either never had any *Matter*, but proceed from such agitating Causes as I mentioned, or remain (as some do) after the *grieving Matter* is carry'd off by *Vomiting*, *Purging*, *&c.*

I forbore mentioning *Pleurisies* and *Peripneumonia's* among the *Fevers*, that it prevents or takes off, because there are great *Disputes* whether *Opiates* are convenient in those Cases, which I hope to determine.

Unless it be when the said Distempers are come to that pass, that it is dangerous to cause *Sleep*, or take away any of the Sense of the *Irritation* of the Matter to be expectorated, lest it

should be too much amass'd in the *Bronchias*, or Wind-pipe, and so choak the Person, I see no cause to forbid them any more than *Sleep*, or *Opiates*, in other *Inflammations*, wherein they are highly beneficial, to give *Ease*, cause *Sleep*, *compose* the *Spirits*, and take off, or at least moderate the *Fever*.

But I see many good *Reasons* to use them: 1. Because, as a *Sal-Volatile-Oleosum*, they reserate and resolve *clammy Humours*, and are so agreeable in Principles (as *Menstruums* should be) to the thing to be resolved; I cannot doubt but *Red Poppy* is, upon *Experience*, stated a *Specifick* in those *Cases* for that *reason*. 2. Because these *Distempers* (as *Hippocrates* speaks) are from a *segregation of Humours* by *Agitation*, *&c.* and *Opiates* excellent *Composers* thereof. 3. Because they are such great *Discussers*; and, 4. Open the *Pores* to let the discussed Matter quite out of the Body. 5. Because it may be that by its *Relaxation* upon such *Resolution*, the lodged Matter may be caused to flow off, and circulate again, and so be gradued, discussed, and carried off by the open *Pores*. 6. Because it envigorates Nature to perform those Things; And, 7. Gives *Ease* and *Recruit* of the *Spirits* by *Sleep*. So that all Things considered, I think (as *Experience* assures us) that *Red Poppy*, or *Opiates* in due *Quantity*, are the very best *Remedies* that can be used. Hence it is that

Wedelius calls *Opium* an *Antipleuritick Specifick*, he having observed, (as I and others have done) That the whole *Course* of the *Disease* and *Expectoration* will succeed much better by their *Use*. He adds also, That he has very often cured them by its help, without *letting of Bloud*; which is an

an infallible ſign of their *good Effect*, ſince the *Pleuriſie* can hardly be cured without *Bleeding*. I cannot ſee how an Effect that bears ſuch Analogy to *Sleep* can do any more *Harm* than *Sleep*.

Etmuller alſo adviſes the giving of *Opiates* not only in the Beginning, but alſo during the *Increaſe* of the *Pleuriſie* or *Peripneumoniæ*: So that I conclude, That they are of *excellent Uſe* in thoſe *Diſeaſes*, unleſs it be when *Sleep* or them may cauſe too much Inſenſibleneſs of the *Bronchiæ*, and ſo retard *Expectoration*, when the Caſe is ſuch that the Want thereof may endanger the Perſon's being choak'd.

We have alſo many *Hiſtories* of Perſons cured in other *Fevers* by large *Doſes* of *Opiates*. I ſuppoſe that *reſinous Opiates* cauſing Vomiting and great Diſturbances, by reaſon of ill *Digeſtion* in thoſe Caſes, might be one great Cauſe of People's *Fears* and *Jealouſies* in giving *Opiates*, which is eaſily prevented by giving *liquid Opiates* void of any reſinous Particles, as the *liquid Panacea*, *&c.*

4. It does, by compoſing, quieting, and appeaſing the Motion and Perturbation of the Bloud, conduce much to the ſtop of its *Efflux* in *Hemorrhages* (or *Bleedings*) that are *unnatural*; as at *Noſe*, in *ſpitting* and *vomiting of Bloud*, *bleeding* at the *Hæmorrhoids*, in *Dyſenteries*, *piſſing of Bloud*, *&c.* and ſometime in profuſe *Menſes*, when they happen from a *Fever*, or too much Motion of the *Bloud* and *Spirits*, and not an *over-Relaxation* or *Dilatation* of the *Pores*, which muſt be well diſtinguiſhed.

I. The *Form* muſt be liquid in all *Fevers*, and is alſo moſt convenient, generally ſpeaking.

II. The

II. The *Doſe* may be the moderate, or middling, *except* it be where the *Pains* are great, or where much of the *Opiate* is loſt, as in *Vomiting*, *Looſneſs*, *&c.* for which ſee the *General Rules*.

III. The *Vehicle* ſhould be (generally ſpeaking) cooling, compoſing, and incraſſating Liquids, as *Emulſions*, *Milk* and *Water*, or the like; but in ſettling the *Stomach* uſe agreeable warm and comfortable Cordials, or *Wine* burnt with *Aromaticks*, or the like.

IV. The *Time* is, when 'tis convenient according to the *General Rules*, and your *Intention* of its Operation; therefore where there are *periodical Paroxyſms*, or *Exacerbations*, as in the *Small-Pox* and many *Diſeaſes*, in the *Afternoons*, or towards the *Evenings*, give it the due *Time* before, that it may have its full *Effect* by the Time the *Paroxyſms*, or *Exacerbations*, are expected to begin; and be not ſo mad as to be regulated by *Night*, or *Day*, or *Bed-time*, *&c.* (as is uſual) which are no *Symptoms*, *Signs*, or *Effects*, of the *Diſtemper*, but of the Motion or Poſition of the *Sun*, *Stars*, *&c.* which are not the Subjects of your Cure, nor can be: The *Want* of which moſt obvious and rational *Practice*, has ſadly diſappointed inconſiderate *Phyſicians*, and often hazarded, if not deſtroyed the *Patients*.

V. The *Regimen* is the ſame as that to cauſe *Sleep* which you have in *Chap.* 35. and ſhould be by all means uſed in this *Caſe*.

1. *Note*, That *Opiates* are not to be uſed (as has been intimated) where the *Commotion*, *Flux*, *&c.* is for apparent and ſpeedy *Benefit* of *Nature*, as in *Vomiting* upon *Repletion*, or to diſcharge the *Stomach* of ſomewhat that offends it, or a *Looſneſs* to clear the *Inteſtines*, or the like.

2. *Note*,

2. *Note*, That when any *Evacuation* is to be made by *Vomit* or *Stool*, the beſt way in theſe Caſes is to uſe large *Dilutions* of ſome contemperating Liquid, inſtead of *Vomitories* and *Purgers*; therefore uſe only lukewarm *Water*, or (which is beſt) boil'd with a little *Carduus* in't, or *Carduus-Poſſet*, or the like, to cauſe *Vomiting*; and more agreeable *Dilutions* for the Inteſtines to waſh off ill *Humours*, as a Gallon of Water, with half an Ounce of Cream of Tartar, or rather the purging Salt of the Waters diſſolved in it, or ſome part thereof, uſing all cold, or but very little warm'd, giving the *Opiate* or *Panacea* immediately after the Perſon has done *Vomiting* or Purging, in a ſmall *Glaſs* of *Wine*, or agreeable *Cordial*, to warm and comfort the *Stomach* and *Inteſtines*, which, becauſe of the ſmallneſs of the *Quantity*, the Moiſture and Coolneſs of the diluting Liquids and the *Opiate*, can cauſe no *Inconvenience* by its inconſiderable *Heat*.

CHAP.

CHAP. XXXIII.

Of the Use of the Panacea of Opium, *&c. to relax.*

HAving shown, that *Opiates* relax all the sensile Parts of the *Body*, and *how*, and *why*; it follows that they are of excellent *Use*,

1. *To prevent and take away all Contractions that happen from grievous Passion, or Sensation,* (*or Pain*) as *Convulsions, Shiverings, Shakings, Cramps, Tensions, Palpitations and Tremors of the Heart* from *Fear, Terrour, Grief, Melancholy, Anxiety, Solicitude, Anger, Fretfulness, Concern, Surprize,* &c. Or from *Cold, Pain, Acids,* &c. as *Contraction* of the *Sphincter* of the *Bladder* from those Causes, by which the *Urine* is often stopt, as also by the *Pain* from the *Hæmorrhoids, Inflammations, Small Pox, Colicks, Acrimony, Excoriation,* &c. (which often hinder the making of *Water*, as they also do sometimes going to *Stool, swallowing,* &c.) *Shivering* in *Ague-Fits*; *Stupors* from *Cold*, or *Pain* which (as was shown) proceed from a *violent Contraction*; in all which it will scarce ever fail of due *Effect*: by this *Means* you may (as I have often done) cure those *Disasters* safely, speedily, and pleasantly even to a *Wonder* and *Amazement*, (as if charm'd by a *Spell*) when others know not what Hand to put to them, and are quite baffled thereby.

By the same Means (tho' little, or not at all minded) you may prevent great *Tumours* upon *Pain*; as when by a *Thorn*, or any *grievous Pain* the *Arm, Legs, Thighs,* &c. begin to swell; for the

the Swelling, which often grows prodigiously, and seizes the whole *Limb*, if not a great Part of the *Body*, threatning and often causing Mortifications and Death it self; is caused by the *Pain* contracting, and so girding the Parts, that the *Bloud*, *Lympha*, &c. cannot pass, by which Means the Humours being stagnated, and crowded in by the Force of the *Arteries*, and dam'd up by the *Contraction*, most dreadful *Tumours* happen; whereas the *Pain* being taken away by the *Opiate*, and all the Parts relaxed, they are, and must be prevented by plain *Mechanism*, if used timely. For *Pain* can cause Tumours by no other Means besides *Contraction*, which *Opium* must prevent by taking away the very *Pain* it self.

2. *To help the Cure of all other Contractions*: as *Tensions*, *Rigidities* of *Nerves*, *Membranes*, *Tendons*, *Ligaments*, *Muscles*, &c.

3. *To relax, or make way for Things to pass*, as *Sweat*, *Fumes*, *Small Pox*, *Measles*, *pestilential*, *or venemous Effluvia*, *Menses*, *Lochia*, and the like, to *pass* through the *Skin* or *Pores*: A *Child*, dead, or alive, *After-birth*, *Mole*, *clodded Bloud*, &c. to *pass* through the Neck of the *Womb*, when too narrow by *Nature*, or contracted by *Pain*, *Cold*, *Terrour*, &c. A *Stone* to pass the *Ureters*, or Neck of the *Bladder*, by taking away the *Pain* that contracts them and hinders the Passage of the *Stone*; so that (in the Hand of an ingenious *Physician*) there is not a better, nor as good a *Remedy* to cause a *Stone* of any passable Bigness to come away, for it passes through the relaxed or widened *Passages* without *Pain*; to help which, other *Relaxers*, as *Warmth*, *emollient Baths*, *Fomentations*, *Clysters*, together with slippery and emollient Things inwardly taken, and at last a great Stream of *Urine* well contrived and timed when the Parts are most relaxed, suppled and lubricated, do much conduce. I would

would have all who are troubled with the *Stone* *Note this.*

Note alſo, That to hold and dam up the Urine a long Time, is of excellent *Uſe* well managed, when the *Stone* is in the *Ureters*, becauſe when the *Urine* has fill'd up the Bladder very tightly, that it will receive no more, it muſt diſtend the *Ureter*, which is the Cauſe that very many are eaſed, either by the removal or diſcharge of the Stone after a ſet *Time*, which gives *Occaſion* to call them *Fits* of the *Stone*, becauſe they laſt for much about the ſame length of *Time*; however, the large and ſudden *Evacuation* of *Urine* muſt, by leaving the Part looſe, *&c.* conduce very much to the Paſſage of the Stone, *Clods of Bloud*, *Phlegm*, *Matter*, &c. that ſteps the *Urine*.

4. *To relax, or make Way for Things to be put into the Body, when there is Occaſion*, as in *Reductions* of *Hernias* (or *Ruptures*) of a *fallen Fundament*, *Womb*, or *Vagina*, in which Caſes it is of neat *Uſe*, both by *relaxing*, and *taking away Pain* during the *Operation*. It may be alſo of *Uſe* when the ſtrictneſs of the *Collum Uteri* hinders the *Admiſſion* of *Sem. viril.* both as a general *Relaxer*, and as cauſing greater *Pleaſure* of thoſe Parts, and a proportionable Relaxation thereof; for it is by the *Pleaſure* in *Coition*, that the *Collum Uteri* is opened, or relaxed, (as is obſerved) which immediately cloſes again, when the ſenſe of *Pleaſure* is ended; yea and ſo much the ſtricter, becauſe the *Loſs* of *Pleaſure* is (as was ſhown) a *Kind* of *Grievance*; hence it is, that *omne Animal poſt coitum eſt triſte*; and not becauſe of loſs of Spirits (as is vulgarly imagined) for we can loſe little or no Spirits by that which is ſo ſeparated for *Excretion* before-*hand*, as the *Semen* is,

5. *To*

5. *To enlarge any Part for the due Reception of what is convenient, or neceſſary,* as the *Breaſts* to receive Milk, (by which Means it comes to be ſuch great *Increaſer of Milk*) The *ſeminal Veſſels*, as *Sem. virile* does upon *Puberty*) to receive the *Semen*: Thus it cauſes the *Penis* to grow, as the *Semen* upon *Puberty* cauſes it, and *Cocks Combs*, Turkey-Cocks red Bags at the Neck, *Proboſcis*, &c. to grow as the Time they are fit for, or begin to tread; for the *Relaxation* cauſed by the *Pleaſure* of the *Semen* makes the Party more capable of the *Nutriment*. Thus it is, that Sleep cauſes the *Growth*, *Fatning*, and Thriving of *Animals*, and red Noſes to grow ſo large by frequent *Relaxation* upon the *Pleaſure* of *Wine*, *Ale*, &c. (as was ſaid) to which Quantity diſtending the Parts, may in the laſt mentioned Caſe contribute.

I. The *Form* of *Opiates* in this Caſe may be either *ſolid*, or *liquid*, as you think fit.

II. The *Doſe* muſt be proportioned to the *Relaxation* that you deſire; for *more* relaxes more; and *leſs*, leſs; ſo muſt it be alſo proportioned to the *Contractions*, that it is to take away; therefore very *grievous Paſſions*, or *Senſations*, which cauſe proportionable *Contractions*, require greater *Doſes*, becauſe their *Grievance* and *Contraction* do ſtrongly oppoſe the *Pleaſure* and *Relaxation* that *Opiates* cauſe; therefore *great Pain* (as you'll find in its due place) requires an extraordinary *Doſe*.

III. The *Vehicle* in *Contractions* from *grievous Paſſions* ſhould be *Wine*, or ſome comfortable *Cordial*; *except* they be the more turbulent *Paſſions*, as *Anger*, *Fury*, &c. where *Compoſers*, as *Emulſions*, *Milk*, and *Water*, &c. are beſt.

In

In all other *Cases*, emollient and suppling *Vehicles* are most proper, as *soft*, *smooth*, and *slippery Decoctions*, *Broths*, &c.

IV. The *Time* to give them is, at the due Distance before Bed Time, when the Intentions are consistent with *Sleep*, which it self is a great *Relaxer*; otherwise any Time will serve, as Occasion or the Intention of the *Physician* requires it.

V. The *Regimen*.

1. As to *Meat* and *Drink*, is using moist, emollient and lubricating Things, as smooth Broth, somewhat fat; butter'd Roots, Herbs, Sawces, Gruels, Milk-Meats, young Flesh, as of roasting Pigs, Veal, Lamb, &c. Smooth Drinks as *Ale*, *Whey*, &c.

2. As to *sleeping* and *waking*; that relaxes, and this contracts; therefore, that *conduces*, this *hinders*.

3. As to *Rest* and *Motion*; that *relaxes*, and this *contracts*.

4. As to the *Passions of the Mind*, the *Pleasant* as *Mirth*, *Joy*, *Pleasure*, Comfort, and all such, do relax; and the *Grievous* as *Terrour*, *Fear*, *Grief*, *Melancholy*, &c. *contract*, as *Pain* does.

5. As to *Air*, the *warm* and *moist*, or that when the *Quicksilver* is low in the *Barometer* (or *Weather-glass*) does *relax*, as do warm *Baths Fomentations*, &c. especially if *emollient*: Dry and cold *Air* and that when the *Quicksilver* is high, do cause *Contraction*.

6. As to *Excretion*, and *Retention*; generally *Excretion* does make *Room* and *Way* for things to pass through, or into the relaxed Parts, (as *Clystering* for Passage of the *Stone*, *Child*, *Reduction* of *Hernias*, &c.) But be sure not to make the *Excretions* grievous, because all *grievous Sensation* causes *Contraction*.

CHAP.

CHAP. XXXIV.

Of the Use of the Panacea *of* Opium, *&c. to take away Pain or grievous Sensation.*

THIS it does (as was shown) by diverting the *sensitive Soul*, and introducing a Sense of *Pleasure*, which, (being contrary to *grievous Sensation* or *Pain*) cannot be in the same *Subject* with *Pain*; but chiefly, and *mechanically* by relaxing all Parts, and permitting the springy *Animal Spirits* to expand, and so become unfit to carry *Impressions* smartly; which is requisite to cause a sense of *Pain*. (as has been proved.)

Therefore it is of most happy and glorious *Use* in all *Pains*, but especially to be used

1. *In such as are not for any Benefit to the Person pain'd*, in *Order* to alter, or evacuate the grieving *Cause*, as in *Pocky*, *scorbutical*, or *hypochondriacal Pains*; or such as proceed from any ill *Habit* of *Body*, &c.

2. *Where Pain hinders the taking away of its Cause or some Benefit*; as when the *Pain* of the *Stone* does by contracting the *Parts* hinder its own *Passage*; that of a *Tenesmus* hinders going to stool; that of the *Sphincter* of the *Bladder* hinders its opening to let out *Urine*, *clodded Blood*, *Phlegm*, *Matter*, or any such Thing; when that of the Neck of the *Womb* hinders Delivery of a *Child*, *After-Birth*, *Mole*, *clodded Blood*, &c. that of the Mouth of the Stomach hinders *Vomiting*, when requisite; or that of the *Pylorus* hinders the *Detrusion* of *Chyle*; or that of the *Intestines*, as by an *Inflammation*, &c. stops

the Passage of the *Ordure*, and causes an *Iliack Passion*; or that of the *Gullet* hinders *swallowing*; of the *Larynx* Breathing; or that of any Part hinders *Perspiration* or desired *Sweat*; or that of the *Venereal Parts* stops the *Menses*, or *Lochia*, &c. In all which *Cases* it is, and must in all *Reason* be of excellent, and (if duly managed) of almost (if not altogether) infallible *Effect*, by taking away the *Pain* which causes the Part to contract, and make the *Stop*, &c.

3. *Where the Cause of the Pain cannot be removed but by Perspiration, Sweat, Menses, Lochia, or Urine*; as in *Pains* in the Habit of the *Body*, *Limbs*, &c. From *Cold*, *Wind*, or *Vapours*, *Gout*, *Rheumatisms*, *Stitches*, *Pleurisies*, *Inflammations*, and many of the *Cases* aforementioned, it is excellent: As it is

4. *Where the Pain, Irritation, or grievous Sensation, causes Nature to work irregularly*, as in *Iliack Passions*, *hysterick Fits*, *Fruitless Convulsions*, *canine Appetite*, &c. In which Cases it excells all other Means for many Reasons.

5. *Where the Pain is not likely to have a timely Effect for good, till People may be too much worn out.*

6. *In all Pains that have not any material Cause* from the *Humours*, &c. of the Body, as such as happen from *Passions*, *Wounds*, *Pricks* of *Nerves*, *Tendons*, *Fractures*, *Dislocations*, *Amputations*, *severe Chirurgical Operations*, &c.

7. *In all Pain from Inflammations, Suppurations, Abscesses, Tumors where Repulsion is not convenient or possible.*

8. *In all Pains that are more likely to cause Fevers than any Benefit, as in many of the former.*

To be short, it is good and useful in all *Pain* and *grievous Sensations.*

1. *Except* all such as tend to the speedy and timely *Benefit* of Persons, as those in *Womens Labour*;

bour; *Grievances* at *Stomach*, that cause Vomiting upon *over-Repletion*, or by Reason of somewhat that grieves, and is not convenient to stay at *Stomach*; or *Irritations* to expectorate, when much wanted, as happens sometimes in *Vomicas*, *Pleurisies*, *Peripneumonias*, &c. Or such as irritate, and solicite to make Water, go to Stool, &c. When Evacuation of *Urine*, *Ordure*, *ill Humours*, &c. is requisite.

2. *Except* when *grievous Sensations* are necessary *Calls* or *Intimations* for *Supply*, *Refreshment*, &c. as *Hunger*, *Thirst*, &c. which should be taken off only by the Pleasure of good *Meat*, and *Drink*; lest Nature be defrauded: Where you may observe an Inconvenience, that may happen by the *frequent Use* of *Opium* taking away *Appetite* without *Nutriment*. Tho' this is much compensated by the *Relaxation*, and *Recruit*, that *Opiates* give, and their moderating the Expence of Spirits by taking of *Contractions*; and may more (if not wholly) by a regular and constant way of *Eating* and *Drinking* temperately at usual *Times*, tho' the *Hunger* may not, by Reason of the *Opiates*, be so great as at other *Times*.

I. The *Form* is indifferent, and to be ordered only according to the *general Rules*, remembring that the Liquid is best for *Speed*.

II. The *Dose* must be proportioned to the *Pain*, or *grievous Sensation*, and always rather more than when there is no *Pain*, because its *Contraction* opposes the *Relaxation* to be induced by the *Opiate*.

Observe this Method. First give a good *Dose*, then stay about 2 or 3 *Hours*, and if the *Pain* be not at all lessen'd, you may safely then give *half* the *Quantity* again, and afterward about a *third* Part of

the *Doſe* every 2 or 3 *Hours* till it begins to abate; but upon the leaſt ſenſible *Abatement*, you muſt forbear to give any more, becauſe that which did in ſome *Meaſure* abate the *Pain*, does in the ſame *Proportion* abate the *Contraction*, and conſequently it has leſs to conteſt with, therefore will be ſure to conquer it; for the ſame *Power*, that could ſubdue *ten* in ſome Meaſure, will ſubdue *nine* in a greater *Meaſure*, and *eight* more eaſily than *nine*, &c. till the *Pain* quite ceaſes; whereas if you add more *Power* to the *Opiate*, it may be too much, eſpecially when the *Pain* is thereby conquered, and that it has no *Contraction* to conteſt with; for then it will be as if a *great Doſe* were given to one that had no *Pain*; but if the *Pain* increaſes again, you may ſafely repeat the *Half Doſe*, &c. every 2 or 3 *Hours*, till it again begins to abate, and no longer; which you had better obſerve to do as ſoon as ever the *Pain* begins to return, becauſe it takes ſome *Time* to operate; it follows then, that the *liquid Form* is moſt convenient in this *Caſe* for *Expedition*.

My particular and effectual manner of uſing it in the Gout, will be ſomewhat too tedious to be ſet down: Therefore ſince it may be obvious enough to the ſagacious, that conſider what has been ſaid, and the Nature of the Diſtemper, I will paſs that by at this Time.

III. The *Vehicle* in *cold Stomachs*, and *Conſtitutions*, may be a Glaſs of *Wine*, or ſome temperate *Cordial*; but in hot *Caſes*, or where a *Fever* is feared, *Emulſions*, *Milk* and *Water*, or *Water* alone, or other acceptable cooling Things, or ſuch as are directed in the Caſe of procuring *Relaxation* in the *laſt Chapter*; becauſe it is *Relaxation* that takes away *Pain*, as has been *mechanically demonſtrated*. But here there is no need of being ſcrupulous as to the *Vehicle*, unleſs it be in reſpect of *Heat* and *Cold*, as the Caſe happens.

IV. The

IV. The *Time* may be any *Hour*, as the Case requires; only remember, that *Sleep* conduces much to *Relaxation*, and therefore to the taking away of *Pain*.

V. The *Regimen* to be used in the Case of *Relaxing* in the last *Chapter* will suffice, but 'tis convenient (as was said) to regard the *Stomach*, and *hot* and *cold Constitutions*; especially where there is any *Fear* of *Fevers*; by giving cooling Liquids, as *Emulsions*, &c. and avoiding hot or *solid Things*, especially such as are hard of *Digestion*, as *Flesh*, *Fish*, *Eggs*, &c.

1. *Note*, That it is very advisable, not to defer the *Use* of *Opiates* too long, till People are very weak, tho' it may seem that they would hinder some due *Evacuation*; for, I cannot see what *Harm* a *Refreshment* by them may do, any more than by *Sleep*, both depending upon the same Cause, viz. *Relaxation*: It is true, that by *Reason* of *Sleep*, or an *Opiate*, the *Evacuation* may be a little defer'd. What then? would any Man deny *Sleep* for that *Reason*? Why then should a *Physician* deny an *Opiate* to cause it, respite *Nature*, and enable it to bear its Burthen, or engage with *Difficulties* the better?

2. Remember always that *Sleep* is a great *Help* to take away *Pain*, and so are all Things that conduce to *Relaxation*, or pleasant *Diversion*.

3. Use Means in *Pain* of the *Hemorrhoids*, *Fundament*, or *Intestinum rectum*, and indeed in any *Pain* within the *Guts* (unless it proceeds from a Looseness) that *Opiates* may not bind Men too much; as *Lenitives* internally, or *emollient Clysters*, or which of them may be most easily and conveniently done, and most to the Purpose.

CHAP. XXXV.

Of the Use of the Panacea *of* Opium, &c. *to cause Sleep.*

IT *primarily* causes *Sleep* by relaxing and composing, quieting, soothing, pleasing, and lulling the *sensitive Soul* and *Spirits*; it always *relaxes*, but does not always sufficiently *compose* or *quiet* the Spirits to cause *Sleep*, to which both are requisite: *Secundarily*, by taking away *grievous Passion* or *Sensation*, when they happen to hinder it.

1. *As Soporiferous, it is of incomparable Use in all troublesom Watchings*, whether they be from *grievous Passion* or *Sensation*, or *irrequiete Motion* of the Spirits, tho' not so certain in this last Case as in the former; and therefore proves sometimes unsuccessful in some *Persons*, and in some sort of *Madnesses*, as the *Merry* or *Furious*, tho' it is effectual in *Melancholy* and slow *Manias*, (as has been intimated) for bare *Relaxation* suffices in the Two *first Cases*, where *Sleep* is hinder'd by *Contraction*, which it never fails to take off, if given in a due Quantity, as has been directed.

2. *To recruit the Spirits*, as when People are tired with *Labour*, *Journeys*, *Diseases*, *Conflicts of Nature*, as by *Convulsions*, *Vomitings*, *Purgings*, *Hysteric Fits*, and the like.

3. *To relax, compose, take away Pain, moderate Fluxes that depend upon grievous Sensation*, (or Irritation) and its consequent *Contraction*; or from *Motion* or *Segregation* of *Humours*.

4. *To*

4. *To promote Fluxes* that depend upon *Relaxation*, as *Perspiration*, *Sweat*; as also the *Menses* and *Lochia* in some Cases; of all which you have particular *Chapters*, which *see.*

I. The *Form* may be indifferently, either *solid* or *liquid*, as 'tis best liked, and most suitable to *People's Minds*, *Palate*, *&c.*

II. The *Dose* moderate, except it be, 1. Where some by *Accident* require otherwise, as *Pain*, *Loosenesses*, *Vomitings*, and to titillate the *Venereal Membranes* because remote; which see in the *respective Chapters* of the Use of *Opiates* in those *Cases.* 2. Where the *general Rules* direct otherwise, as in the *soft fleshed* People, *Children*, *Women*, *&c.* where the Dose must be less.

III. The *Vehicle* must be the same as is directed to Compose; but in *old People* 'tis observed, that smooth Spirituous Things, as good Ale, *&c.* conduce very much to cause Sleep, because *Sulphurs* do qualifie the *Volatile Salt* of the *Opium* (as was shewn.)

IV. The *Time* in *general* is at the due distance before Bed-time, that is directed in the *general Rules*; but *Opiates* may be given at any *Time* when the Case requires, as in the *Small-Pox* about 12, 1, or 2 in the *Afternoon*, according as the *Exacerbations* (which happen in the *Afternoon*, or towards the *Evenings*) do seise them; and in *Agues*, at the due *distance* before the *Paroxysm* invades them; so that the Operation thereof may be full and compleat before the *Time* that the *Fits* are to begin; and so in all other *Cases* of the like Kind.

V. The *Regimen* in this Case must have a Twofold Aspect; 1. To promote *Relaxation.* 2. To compose and quiet *Motions* and *Perturbations* of the *Spirits*, *Blood*, *&c. Relaxation* and *Quiet* being the Two Causers of *Sleep.*

As to the *first*, the *Regimen* must be the same as is directed in the *Chapter* of the *Use* of the *Panacea*, *&c.* to *relax*; but as to *composing* and *quieting* the *Spirits*, I shall add somewhat, tho' *Relaxers* are generally good for this Purpose, unless join'd with some agitating *Accidents*, as *Heat*, or the like.

1. As to *Diet*, it should consist of *cooling*, *incrassating*, *invisicating Things*, that are not *aromatick*, *acid*, or *saline*; such are *Milk-Meats*, *Emulsions*, *Almond Milks*, *Chicken Broth*, with cooling Herbs, *Water-gruel*, *fresh* and *young soft Flesh*, *Lettuce*, *Purslane*, *Spinage*, *Herb Mercury*, *Mallows*, and such like; *Mucilages*, as of *Quince*, *Fleabane*, &c. The *Drink* may be *Milk and Water*, Whey, or such unfermented Liquors, or smooth Small Beer not too old, for all stale Drink is naught; *Water* where it agrees, *&c.*

2. *Rest of Body and Spirits* must be contrived by all means, as by *leaning*, *lying*, or *sitting still* without any motion after it is taken, till Bed-time, and therefore let the Person (if the *Season* permits) be as much undressed as may be, in a *loose Garment*, or *Morning-Gown*, all that *Time*, and be help'd off with his Cloaths, that he may not agitate his *Body*; when sleepy, (and not before) let him go into a cold Bed in Summer, and but a little warm'd in Winter, and only have what Bed-cloaths suffices, and pleases him best, and then lie absolutely still without *Noise*, *Light*, or *Fire* in the Room.

3. *Rest and Tranquility of Mind* is very necessary, which should be not only free from *grievous Passions*, but from all Excess of Joyous ones, which too much agitate the Spirits.

4. The *Air* should be moist and moderate, and if not such by the *Weather*, render'd so by *Art*, especially in *Fevers*.

5. All

5. All *Evacuations* ſhould be made, that may any *way* diſturb his *Sleep*, before he betakes himſelf to it; nor ſhould the *Stomach* be overfull or empty, leſt any *Grievance* may be thereby created.

6. *Emollient tepid Baths*, *Fomentations*, *Feet-waſhes*, *&c.* do finely diſpoſe People to Sleep, but take care they be not too hot, for heat cauſes a *ſtir* of *Bloud* and *Spirits*, which is an Enemy to *Sleep*.

1. *Note*, That *long Sleeps* after great *Fatigues*, or long *Watching*, ought not to be very frightful, if the *Doſe* was moderate, and that the Perſon takes *Suſtenance*.

2 *Note*, That old or dry Perſons, or ſuch as are very unapt to Sleep after *Opiates*, are often cauſed to *Sleep* by *ſmooth Wine*, *Ale*, *Cowſlip Wine*, or the like, becauſe the gentle *Oilineſs* of ſuch *Liquors* do correct the *Acrimony* of their *Volatile Salts*, and at the ſame time cauſe a Senſe of *Pleaſure*, which relaxes and cauſes *Sleep*. It has been obſerved, that even *Ambergriſe* and *Muſk* (which exagitate the Bloud and Spirits) cauſe old Men to Sleep, which happens by their *fine Sulphur* readily faſtening upon the *acrimonious Volatile Salts*, as *Spirit* of *Wine* does upon *Sal Ammoniac*, which being mixed do ſoon *coagulate*: Therefore I am apt to think, that *Camphire* would be of excellent *Uſe* to correct the *Opium*, and the *volatile Salts* of the Body in ſuch Caſes, becauſe it is Experimentally certain, that it corrects the *Acrimony* of *Urine*, of *Semen Virile*, *Cantharides*, *&c.*

3. *Note*, That the drier the Body is, the more unapt are *Opiates* to cauſe *Sleep*; therefore dry *Bodies*, as of *old Men*, *Hectical Perſons*, *&c.* ſhould be well moiſtened by *incraſſative Moiſteners*, as *Emulſions*, and ſuch Things as are above-mentioned and ordered in the *Chapter* of the relaxing *Uſe* of *Opiates*.

From

From what is ſaid, I do conclude, that *Opiates* do cauſe *Sleep* very readily where the *Oily Parts* abound; and that Things, that have a fine *Oleous Sulphur*, are very good *Correctors* of it, where acrimonious *Volatile Salts* abound, in order to cauſe *Sleep*; and that hence it is, that ſome ancient People will often Sleep better by the Uſe of the aforementioned ſmooth *fermented ſulphureous Liquors*, than by the *Uſe* of *Opium*; from all which it appears, that *Sleep* is not ſuch a *Property* of *Opium* as People make it to be, becauſe, that beſides relaxing, *Sleep* alſo requires a great *Reſt* of the *Spirits*, and the *ſenſitive Soul*.

It ſeems very probable from the Premiſes, that *Anodyne Sulphur* of *Vitriol* would be excellent to cauſe *old Men* to Sleep; for it doubtleſs cauſes Sleep only by obtunding and qualifying our *Volatile Salts*, as *White Roſin*, and other *Balſamicks*, will often do.

CHAP.

CHAP. XXXVI.

Of the Uſe of the Panacea *of* Opium, &c. *to ſtop Fluxes.*

IT *palliates, moderates, and ſtops Fluxes*; 1. By taking away the ſenſe of the Irritation of Humours, which cauſe *Contraction* to ſqueeſe them out, and promote their motion. 2. Becauſe it compoſes and ſtills the motion of Humours by the *Relaxation* and the *Sleep* that it cauſes, which quiets motions. 3. Becauſe thereby, and by its combining *Agreeableneſs* and *Texture*, it *congregates* the *diſgregated Humours*. 4. Becauſe the *Relaxation* ſuſpends the *Humours*. 5. Becauſe it *diſcuſſes* ill *Humours*. 6. Becauſe the *Pores* being opened by the *Relaxation*, the Humours that cauſed the Fluxes are gradually perſpired by that moſt natural and univerſal ſort of *Evacuation*; for 'tis plain *Reaſon* and common *Obſervation*, that a plentiful *Evacuation* at *Pores* ſtops *Fluxes per Anum, &c.* and if it continues, perfectly *cures* them. ☞ Hence it is, that the *Uſe* of *Opiates* continued, does happily not only palliate, but perfectly cure *Diarrheas, Dyſenteries, Defluxions, Catarrhs, &c.*

It therefore follows, that it is of great *Uſe*,

1. *To palliate, moderate, or cure all Fluxes that proceed from Irritation of Humours*, as *Vomitings, Looſeneſſes*, cauſed by the Humours of the Body, or Things given, as *Diarrheas, Dyſenteries, Artificial Purging, Iliack Paſſions, Cholera Morbus*, (after the Humour is ſomewhat ſpent) *Defluxions, Catarrhs, immoderate Spitting, Gonorrhea Notha*, (that is,

is, of ſlimy Humours by Reaſon of *Acrimony*) *Fluor albus* from the like Cauſe, or any other *Flux* of that Kind.

2. *To moderate or cure Fluxes that proceed from too much motion of the Bloud, Humours, &c.* as *Hemorrhages* at *Noſe, Lungs, Stomach*, by the *Hemorrhoids, Piſſing of Bloud, immoderate Flux* of *Bloud* by the *Menſes, Lochia*, Stool, *&c.* when they proceed from that Cauſe, as may alſo ſome *Defluxions.*

3. *To ſtop Fluxes that proceed* (as *Hippocrates* ſays) from *Segregation of Humours*, by compoſing and combining them; from which Cauſe many ſuch *Fluxes*, as I have mentioned, do happen.

But it is not adviſable to uſe them in *Fluxes*, that are apparently, or very probably, for ſpeedy and ready Benefit; otherwiſe (as was ſaid of *Pain*) uſe them to reſpite *Nature*, which they do as *Sleep* does, nay, in many *Caſes*, the Continuance of their *Uſe* may quite Cure them, for the ſeveral *Reaſons* given in the beginning of this *Chapter*; What a pleaſant *Cure* then do ſome refuſe that reject them? leaving their *Patients* to be worn out with diſmal *Pains, tedious* and *profuſe Evacuations, want of Appetite and Digeſtion*, the common Conſequences of *Diarrheas, Diſenteries, &c.*

I. The *Form* of *Opiates* in this *Caſe* ſhould generally be *ſolid*, becauſe it ſticks better to its Work; whereas the *fluid* is more ſubject to be evacuated in *Diarrheas, Dyſenteries*, and *Vomitings*, tho' ſometimes the *Liquid* may be convenient in *Vomitings*, as when that Form is more agreeable to the *Stomach*, or that you would have a more ſpeedy *Effect, &c.* In other *Fluxes*, where the *Opiate* is not liable to be evacuated too ſoon, it is indifferent what *Form* you uſe. II. The

II. The *Doſe* in *Fluxes*, where 'tis probable ſome Part of the *Opiate* may be carried off without *Effect*, as in *Vomitings*, *Diarrhœas*, *Dyſenteries*, *Choleras*, *&c.* the *Doſe* muſt be (generally ſpeaking) pretty large, otherwiſe a *moderate Doſe* may ſerve; In ſuch *Caſes* due Conſideration is to be had of what is loſt by the *Evacuation*, at which you may eaſily gueſs in *Vomiting*, by what comes up, if its *Colour*, *Smell*, *Taſte*, be obſerved, as alſo by the *Frequency* and *Violence* of the *Vomiting*, and noting how the *Stomach* clears it ſelf of what is ingeſted by the *Quantity*; and laſtly, by the *Effect*; of which, if what was given fails, more of the *Opiate* muſt be given by *degrees*, till it ſtops the *Vomiting* in ſome meaſure.

In *Looſeneſſes* give Half the firſt *Doſe* every Four *Hours* till the *Flux* begins to be moderated, then be more wary in giving it, for what is afterward given may have its full *Effect*; therefore be very cautious, by giving but ſmall Quantities both in this Caſe and in *Vomiting*, when they are moderated in ſome *degree*, becauſe *Opiates* then have their full Effect without any *Diminution* or *Oppoſition* thereof.

In other *Fluxes* a *moderate Doſe* may ſerve, as in *Defluxions*, *Catarrhs*, *&c.* however let the *Doſe* rather incline to the higheſt than the loweſt, and ſuffice (if poſſible) to cauſe Sleep, which is a great Effect in theſe Caſes.

III. The *Vehicle* in *Vomiting* ſhould be ſmall in *Quantity*, pleaſant, comfortable, and warming, leſt you ſhould by either *Quantity* or *Quality* give any offence to the Stomach; pleaſing it anſwers the ſame *Intent* with the *Opiate* it ſelf, and has often good *Effect* without *Opium*; for, indeed, every

every *Pleaſer* is proportionably an *Opiate*, and *Opium* is only ſuch in an *intenſe* and permanent *manner*; therefore the *Vehicle* muſt be agreeable, as *Wine*, *Hippocras*, or *Wine* burnt with *Spices*, *Roſemary*, *&c.* or the beſt *Cordials*, or *Wine* with ſome *Ketchup*, *Caviare*, or *Anchovies*, or a little *old Cheeſe* diſſolved in it upon the Fire, according as the Perſon likes *one* or the *other*; which laſt (tho' not uſed in common *Practice*) are of very great *Benefit*, where they are pleaſing and well liked of.

In *Looſeneſſes*, ſuch *Wines* and *Cordials* as are *ſubaſtringent* ſhould be afforded (after the peccant Matter is evacuated) to comfort the *Bowels*; but the *mentioned Salt Things* are not convenient in this *Caſe*.

In *Defluxions*, incraſſative *Compoſers* are the beſt *Vehicles*, as *Emulſions*, *&c.* See the *Vehicles* for Compoſing, for they are all proper in this *Caſe* alſo.

IV. The *Time* is at any *Hour* when there is *Occaſion*; but *Sleep* conducing, the proper Time will be (unleſs Need otherwiſe requires) at the due and directed diſtance before Bed-time.

V. The *Regimen*.

1. As to *Diet* in *Vomitings*, offer nothing to the *Stomach* but ſuch Things, and in ſuch *Quantities*, as was directed for *Vehicles*; only in *Vomiting*, before the grieving Matter is diſcharged, it will be often convenient, before the *Opiate* is given, to give *good Quantities* of innocent *Diluters*, as luke-warm Water, plain or *Carduus-Poſſet*, between the *Vomits*, to dilate and render the

the *Vomiting* more eaſie; but when you would ſtop the *Vomiting*, uſe but *ſmall Quantities* of ſuch Things as are above directed for *Vehicles*.

Diluters in great Quantity do alſo ſucceed very well in *Looſeneſſes*, to waſh off the *ill Humours* before the *Opiate* is given, and it is the beſt *Practice* that can be; but the *Chalybeate Waters* are the very beſt for that Purpoſe, (tho' *Poſſet*, or very thin *Chicken*, or *Mutton Broth*, are uſeful) for it anſwers all good *Intentions*, it *dilutes* and *qualifies* the peccant *Humours*, ſtrengthens the *Bowels*, leaves a *binding Quality* after the *Dilution* is made, reſtores *Appetite* and *Digeſtion*, which are both much amiſs in ſuch *Caſes*, and adds moiſture to the *Bloud*, which is under a *Fret* or *Febricula* for want thereof, becauſe all *Liquids* are carried off by Stool; but much of this goes to the *Bloud*, where it alſo waſhes off ill *ſaline Particles*; ſo that (believe me) it is of it ſelf a moſt compleat and adequate *Remedy* in ſuch *Caſes*, if taken to 3 or 4 Quarts for 1, 2, or 3 *Days*.

1. *Solid Meats*, or Things hard of *Digeſtion*, muſt be avoided, becauſe the *Digeſtion* is infirm, but *Milks* thicken'd with *Rice* or *Flower*, *Rice Gruels*, a *light Bread* or *Rice Pudding*, *Gellies*, *Marmalet*, a *Toſt* out of *Claret* with *Nutmeg*, *Cinnamon*, and ſome *Loaf Sugar*, *Emulſions*, *Almond Milk*, *Cheeſe-Cakes*, *Cuſtards*, and all *ſubaſtringent Incraſſatives* are beſt, as alſo in all *Defluxions*.

2. As to *Sleeping*, and *Waking*; that's *good*, and this *bad*.

3. As to *Reſt*, and *Motion*; that is convenient, this not.

4. As

4. As to *Paſſions*, the *joyous* are convenient, the *grievous* not.

5. As to *Air*, the *dry* and *temperate* is beſt.

6. As to *Excretion* and *Retention*, what is ſaid above is ſufficient, ſaving that *Vomits* are very often convenient (eſpecially if the *Looſeneſs* is occaſioned by the *Stomach*) to moderate it before the Opiate is given.

CHAP.

CHAP. XXXVII.

Of the Use of the Panacea *of* Opium, &c. *to cause Fluxes or Evacuations, as Perspiration, Sweat,* &c.

IT (as was shewn) promotes some *Fluxes*, or *Evacuations*, by relaxing and opening the *Pores*. Therefore,

1. *It is of excellent Use to carry away noxious Vapours, or Effluvia's, by the Pores of the Skin,* to prevent *Putrefactions*, and cure them; to carry off *venomous Particles* in the *Plague*, *infectious Distempers*, *Bitings of Serpents*, *mad Dogs*, *&c.* ill *Fumes*, *Wind* in the *Blood*, or *Habit* of the *Body*, that causes *Stitches*, *Tumors*, *&c.*

2. *To carry off noxious Humours the same way*; especially such as stagnate or offend in the *Habit* of the *Body*; as in *Colds*, *intercutaneous Water*, *Leucophlegmatia*; and sometimes in *Dropsies*; (as Dr. *Willis* observes) in *Declinations* of *Diseases*, to carry off the concocted morbid Matter in *Rheumatisms* and *Gouts*, particularly that which is call'd the *Wind Gout*.

3. *When Perspiration is any way hindred*, as by grievous *Passions*, *Sensations*, (or *Pain*) acid, austere, or cold *Humour*, by which many *Diseases* are caused. Thus 'tis very useful in *Grief*, *Sorrow*, *Anxieties*, *Solicitude*, *Melancholy*, *Panick Fears*, *Cachexies*, *Scurvies*, *Hypochondriacal Cases*, wherein it performs wonderfully when all things fail, as you find in *Chap.* 24.

4. *To promote the* Menses *or* Lochia, *when stopp'd by reason of the constriction of the Pores* by such grievous *Passions* or *Sensations*, or by *acid*, *austere*, or *cold Humours*, external Cold, *&c.* by its relaxing and opening the *Pores* and *Ways*, and soliciting the Parts by a gentle agreeable *Titillation*: Hence some justly call it ἀνασπαστὴν τῶν φλεβῶν, that is, *An Opener of the Mouth of the Veins*, (or *Blood-Vessels*) by which means (as has been shewn) *Puberty*, *Coition*, *&c.* do kindly and naturally cause the *Menses* to flow, while the same Relaxation causes an *Increase* of *Blood*, as it does of *Milk*, by widening the *Vessels*. This is all *Mechanical Truth*, that will answer, upon Experience, as the most Ingenious Dr. *Edw. Brown* can witness, who is the only Man (as far as I know) that seems to have this *Practice*.

5. *It promotes Urine*, by the like opening or relaxing of the Pores of the Kidneys by its *titillating Volatile Salt*, as *Cantharides*, *Bees*, *Pismires*, *Millepedes*, *&c.* do.

6. *It may probably be of great use in cutaneous Distempers*, either by taking large Quantities of proper Liquids, and sweating them out again by its help, to wash of ill *Particles*, or to open the *Pores* for the admission of *external Medicaments*.

Note, That they are *natural Fluxes* it promotes, and *unnatural* ones that it stops; which proves its operating as an *entire Friend* to *Nature* both *ways*.

I. The *Form* may be which you please, or is most agreeable to the *Patient*.

II. The *Dose* moderate, *except* it be when extraordinary *Relaxation* or *opening of the Pores* is desired.

III. The *Vehicle* should be such as is proper to prepare the *Humours* to pass by *Sweat*, or *insensible*

ſible Perſpiration, or the *Blood* by the *Menſes* and *Lochia*; therefore ſhould (generally ſpeaking) conſiſt of attenuating Things, as *Volatile Spirits*; and in the *Plague*, *venemous* and *contagious Caſes*, of *Alexipharmacks*; of *Diuretcks* to promote Urine; and ſo in all *Caſes* of what is proper in the reſpective Humours for their *Exit* or *Paſſage*.

IV. The *Time* (becauſe *Sleep* conduces to open the *Pores*) may be at the due *diſtance* before *Bed-time*; but that hinders not but it may be given, when there is occaſion, at any other time.

In the *Plague* it ſhould be ſo often given as to keep the *Pores* always open. *Mayern* gives an *Inſtance* of a *Phyſician* that had all Signs of *Death*, *Petechiæ*, a *Carbuncle*, &c. who recovered by taking *Laudanum* 6 times a *day*, (I ſuppoſe 24 *Hours*, or the *natural Day* is meant thereby.)

V. The *Regimen* muſt be ſuch as is proper, convenient, and uſual in the *reſpective Caſes*; for 'tis endleſs to mention all; it requires a *Volume*.

To *cauſe Sweat*, much temperate Liquids muſt be always given, eſpecially in *Fevers* or *dry Bodies*, as the *Hypochondriacal*, *&c.* Moſt part of the Liquids ſhould be given before the *Opiate*, that they may have time to get into the Blood by that time the *Opiate* operates, which does ſo (as was ſhewn) while 'tis at *Stomach*.

To *move the Menſes*, proper means ſhould be uſed for a due time before the *Uſe* thereof, becauſe the *Effect* expected in this Caſe from *Opiates*, is only to open the *Ways* or *Pores*: So *Humours* in *Leucophlegmatia's*, *&c.* ſhould be duly prepared for the like *Reaſon*.

To *cauſe Perſpiration*, it is convenient in *cold Conſtitutions*, and *old People*, gently to warm the

Bloud with 2 or 3 Glasses of generous *Wine*, a little *Garlick*, *Onions*, *Selery*, or the like, to attenuate and cause *Evaporation*, which *Heat* promotes; but if you over-heat the *Bloud*, it hinders *Perspiration* by its growing grievous; for what is so, causes *Contraction* and closing of the *Pores*.

Note, That nothing can be so good to cause *Perspiration* or *Sweat*, because it not only opens the *Pores*, but takes away any grievous *Passion* or *Sensation* that may close them, and attenuates, resolves, *&c.* by its *Volatile Salt*.

CHAP.

CHAP. XXXVIII.

Of the Use of the Panacea, &c. *as a Titillative.*

THis it does (as was shewn) by its *Volatile Salt*, as *Cantharides*, *Bees*, *Pismire*, *Sem. Viril.* &c. Therefore,

1. *It is of great use to excite to Venery, cause Erections,* to actuate a dull *Semen* for the sake of lawful *Propagation.*

2. *To increase the Semen*; 1. By the *Titillation* of the *Venereal Parts*, which invites it thither by the *Agitation* thereof, as *Frication* of the *Breasts*, and those Parts, cause Increase of *Milk* and the *Semen.* 2. By the *Pleasure* thereof relaxing the *Parts*, which causes a greater Flux of it, (as of *Milk* to the *Breasts*, and Nourishment to any Part.)

It is observable how desirous *Rachel*, being Barren, was of the *Opiate* call'd *Mandrake*, so that she parted with her *Beloved Husband* to her Sister *Leah* for a Night to purchase it: Whether it was any means to cause her to Conceive, which she did afterwards, is not to be determined, tho' it seems not altogether unlikely.

3. *Its Use to increase Milk* is spoken of in the Chapter of its Use to *Relax*, only it does it here as *Titillating*, and there as *Relaxing.*

4. *It conduces to move the Menses* by its *Titillation.*

5. *The Titillation of its Volatile Salt*, (as *Cantharides*, *&c.* do) *moves us to Urine.*

I. The *Form* is wholly indifferent.

II. The *Doſe* muſt be *large*, and generally greater than any I have mentioned, and poſſibly requires a *Repetition* thereof to excite to *Venery*; tho' I ſhall not preſcribe any more than I have in the *Table* of *Doſes*, but leave it to *Judicious Phyſicians* to do as they think fit, where there is a *juſt Cauſe* for its *Uſe*, which I will not expoſe to every luſtful *Goat*.

It is not unlikely but one great Cauſe of the *Ignorance* of its *Uſe* to excite *Venery* in theſe *Weſtern Parts* of the World, may be the ſmallneſs of the *Doſes* that we uſe, beſides the *Reaſons* mentioned in *Chap.* 8. and that ſuch Circumſtances might occaſion the *Diſputes* and *Contradictions* that have been about the *Effect* of *Opium*; whereas there is nothing more ſure than that it has ſuch an *Effect*, (if the Doſe be large enough) and that moſt of the *Eaſtern Nations* uſe it for that end with *infallible Effect*.

III. The *Time* ſhould be 5 or 6 *hours* before the *Effect* is expected, or at Bed-time, to cauſe its *Effects* towards the *Morning*, particularly in the Caſe of exciting to *Venery*.

IV. The *Regimen*.

As to *Diet*, it muſt be Nouriſhing, Warming, Comforting, and Titillating, with *reliſhing* and *high Sauces*, *Oiſters*, *Anchovy*, *Caviare*, *Cockles*, *Ketchup*, *Mango's*, *Garlick*, *Onions*, *Leeks*, *Bears Garlick*, *Rocket*, *Sives*, *Shelot*, *Ginger*, *Aromaticks*, *Roots of Satyrion*, *Feaverfew*, *Goats-beard*, *Silver-weed*, *Skirrets*, *Parſnips*, and *Artichoaks*.

The

The *Uſe* of *Ambergriſe*, *Muſk*, and *Civet*, is commended; but good *Stomach-Wines*, and the like, are certainly of Uſe; *Sine Baccho friget Venus*: But it is certain, That *Camphire* and *ſulphureous Things unfermented*, as *Oils*, *Roſins*, and *fat Things*, oppoſe *Titillation*, as do alſo ſlimy, mucilaginous, and cooling Things.

CHAP. XXXIX.

Of the Use of the Panacea *of* Opium, *&c. to cause Watching.*

I Have shewn how *Opiates* cause *Watching* in some *Persons*, by *reason* of the over-agitating and actuating the *Spirits*, and *Titillating* by its *Volatile Salt*; yet do they, by causing *Pleasure* and *Relaxation*, support the *Spirits*, while the extraordinary *Ovation* of them hinders *Sleep*.

Therefore it is of *Use* to such as it causes *Watching* to, when 'tis requisite for them to watch about any *Business*, *Labour*, *Journeys*, *&c.*

I. The *Form* may be either *Solid* or *Liquid*.
II. The *Dose* moderate.
III. The *Vehicle* should be *Acids*, or other Liquids with Volatile Salts.
IV. The *Time* may be at any *Hour* when wanted.
V. The *Regimen*, quite contrary to that of *Sleep* and *Relaxation*, *viz.* to use *voluntary Motion*, *&c.*

CHAP.

CHAP. XL.

Of the Alterative Use of the Panacea *of* Opium.

YOU see the mighty *Extent* and *general Use* of the *Panacea of Opium* as a *Pleaser of Sensation*, which takes up the Nine last *Chapters*, to mention the Heads of its *Performances* without descending into all particulars, because their Number is indefinite.

How universal then must its *Use* be, when we add thereto its Effects as a consummate *Alterative* which, 1. *Invigorates Nature* by comforting the sublimest Principles thereof, *viz.* the *sensitive Soul* and *Spirits*, that are the Original of all Motion and Action. 2. *Furnishes them with an indefatigable Euphory* in the great Business of our *Preservation*. 3. *Puts the best Means into the Hands of invigorated Nature* for that End, that is, most *agreeable Principles*, even more powerful, and of a greater *Energy* than our own; which must (as agreeable and exalted *Menstruums* do) resolve all Humours, *congregating* the good, and homogeneous, and *separating* the effete and heterogeneous Parts, which is, 4. *Discusses and dissipates*, by its brisk and active *Volatile Salt*, and *at last*, 5. *conveys out of the Body* by a *liberal Perspiration*, the *most natural, universal, and copious* Way of *Evacuation*.

All which being considered, it is (I think) manifest, that it must excel all other *Panaceas*.

1. Because

1. Because *it takes away the Grievance* or *Form of Diseases upon the very first Administration thereof*, whereas other *Medicaments* do that but gradually as they alter or subdue the *Matter*.

2. *Because it highly comforts Nature* (or the *sensitive Soul*, and *Spirits*) *from the very Commencement of the Cure*, and through the whole Process thereof, if duly repeated; which other *Medicaments* do only by insensible *Degrees*, as they gain upon the *Diseases*.

3. *Because it procures Sleep*, the sweet and chief Refreshment of, and first *Cure* in *Nature*, so that I cannot see what can be desired in a *Medicament* that it is not accomplished with; whereas other *Panaceas* are deficient, or at least come very short of ours in these *extraordinary Qualifications*, which seem to make it absolutely *compleat* and *consummate*.

4. Because it from the very first *composes all Perturbations* and *enormous Motions* of the *sensitive Soul* or *Spirits*; which *Helmont* attributes to the *Archæus*, placing all Diseases therein, and therefore says "*Ort. Imag. Morb.* Sect. 12. *Universale quoddam ar-*"*canum consopotivum, & sedativum Archæi est adhi-*"*bendum*, that is, *An universal Remedy, that appeases* "*the Archæus, should be used.* And what appeases or composes it more than, or as much as *Opiates? Therefore* I cannot wonder that *Paracelsus* should declare that it served his *Purpose* when all his *Arcanas* fail'd; or that *Helmont* should be in a *Rapture* upon the Apprehension of the Excellency of *Opium* if the noxious Quality were separated from it, tho' he had a very wrong Notion of its Operation as appears, *Potest. Medicam.* Sect. 4. where he says, that *Opium Archæum abigit, & fugat*, that is, *Opium chases and puts the Archæus to flight*, which on the contrary it highly pleases, and comforts.

It is endless, and a *Kind* of *Impertinence*, to descend into *Particulars* in the *Use* of a Panacea. Therefore having shown how it operates by *invigorating Nature*, causing *Euphory*, *Ease*, *Sleep*, *resolving all Humours*, (as a general *Menstruum*, or *Alkahest*) *congregating the good*, *separating*, *discussing*, *and carrying off the bad Particles*, &c. it remains only, that I show you how to use it, as to *Form*, *Dose*, &c. leaving the Administration thereof in particular Cases to *Physicians*, therein concern'd.

I. The *Form*, that I mainly approve of to alter, is the *Liquid*, because the *solid* is in some Measure (tho' not much) impair'd by the *Evaporation* to the due *Consistence*, and does not consist of the finest Parts, as the liquid does.

II. The *Dose* may be at first about 20 *Drops*, adding a *Drop* to every *Dose*, till the Distemper is in good measure abated; then let the same Number of *Drops* be continued till the Person is well, and afterward abated by a *Drop* every Day till you come to ten, or less, or to such an inconsiderable *Dose*, that you can find no Effect at all.

Note, That tho' I am cautious in the *Dosing* till trusty Experience gives more *Assurance*, yet do I believe that no Inconvenience will be found by far greater Doses, if by any, unless very excessive, as 1 or 2 *Gallons* of *Wine* is in respect of a *Pint*, which in such *Doses* may be, and is injurious.

Such as have *Pain* to be taken off, must use it as is directed in the *Chapter* of its *Use* to take away *Pain*, gradually encreasing so as to keep it off, and when the *Cure* is in great Measure perform'd, must continue and decrease as is aforesaid; the like is to be said as to *Fluxes*, &c.

III. The

III. The *Vehicle* may be in *general* plain *Water*, or rather altered, and made bitter by an Infusion of the Ingredients of the *bitter Decoction*, or *Agrimony*, *Wood-sage*, *Bean Trefoil*, or the like good bitter Things, that are known by *Experience* to cause a good *Digestion*.

In *particular Cases* the *Vehicle* may be appropriated to the *Disease*; yet always so ordering it, that it may be *stomachical*.

IV. The *Time* should generally be in the Morning, unless *Sleep* at *Nights* is to be procured thereby; if so, you must order Things as in the *Chapter* of its *Use* to cause *Sleep*.

V. The *Regimen* must be exact *Temperance* and *Moderation* in all Things. and,

1. As to *Diet*, let it be appropriated to the *Diseases*, and always of such Things as the *Stomach* digests without any *Difficulty* or *Disturbance*.

2. As to *Sleep*, it should be moderate, yet so much as fully recruits and refreshes.

3. As to *Rest* and *Motion*, the like Moderation must be used; for Motion must not be *violent*, or over-wasting of the Spirits in any *Respect*; yet must gentle Motion and Exercise be used; Riding on Horseback (to such as can do it) is a very wholsom *Exercise*.

4. As to *Excretion* and *Retension*, you should never *Purge*, or *Vomit*, during its *Use*, unless there be a very special Cause; and then I would have the *Vomit* to be only carduated *Water*, and for Stools, only so much of the *Scots Pill*, or *Stomach Pill*, as will serve to open the *Body*, to be taken at *Bed-Time*, or at such *Time* of the Night as to cause no Disturbance before you are up in the *Morning*; but (generally speaking) causing no *Evacuation* is best, but what is the Consequence of the *Panacea* it self, which causes the *best*, most *natural*, *universal*, and *considerable Evacuation* by the *Pores*

5. As

5. As to the *Air* the dry, and temperate as to *Heat* and *Cold*, but rather inclining to Coldneſs, is the beſt; for you cannot ſo well err on this Hand, becauſe the *Pores* will be kept open, and Colds prevented in a high manner by the *Uſe* of the *Panacea*, beſides that *Coolneſs* is moſt agreeable to *Digeſtion*.

6. As to *Paſſions* of the Mind, all the grievous ones ſhould be avoided, and a fine even *Chearfulneſs* maintain'd as much as may be; it will be very eaſily continued by the *Help* of the *Panacea*, which cauſes it above all Things.

1. *Note*, That theſe *Directions* do generally concern its *Uſe* in *Chronical Caſes*; for as to *acute Diſeaſes*, and *particular Caſes*; it muſt be left to the *Management* of the *preſent Phyſician*.

2. *Note*, That its *Uſe* as an *Evacuative* has been ſufficiently treated of in the *Chapter* of its *Uſe* to cauſe *Fluxes* and *Evacuations*.

3. *Note*. That notwithſtanding all I have ſaid of the moſt excellent *Qualifications* of the *Panacea* of *Opium*, I ſubmit all to farther *Experience*, at the *Introduction* of which I mainly aim, by endeavouring to take off *People's Fears* and *Jealouſies*; which have ever been the greateſt Hinderers of Improvement in Cure, more eſpecially in *Reference* to the Uſe of *Opiates*, (which without Doubt) will cure many *Diſeaſes* more than ever they were uſed for, (at leaſt as *Alteratives*) which if my *Diſcourſe* does Occaſion, I ſhall thank and praiſe the *Author* of all Good, for making me inſtrumental thereto.

CHAP.

CHAP. XLI.

Of the External Use of Opium.

ITS *External Use* is (as the *Internal*) either,

I. As a *Pleaser of Sensation* (or an Opiate ſpecially ſo call'd) *or*;
II. As an *Alterative*.

First, as a *Pleaser of Senſation*, (or an *Opiate*, properly and ſpecially ſo called) it is ſcarce worth while to treat of it (becauſe of the *Uncertainty*, *Ineffectualneſs*, and ſometimes *Danger* thereof) unleſs it be to *caution* Men concerning it; for my part, I ſeldom or never uſed it *externally*, unleſs it was in *Venice-Treacle*, *Diaſcordium*, or *Mithridate*, which have but little *Quantities* thereof; nor can I ſee why it ſhould be at all uſed *externally* as an Opiate, *except* it be when *Opiates* cannot be uſed *internally*, where they have more even, certain, and better *Effect*; or in very few *Caſes* which will be mentioned: The main therefore that I can do in this *Caſe*, is to acquaint you what others have found by *Experience* concerning its *external Uſe*.

1. It has been found dangerous to apply *Opiates* to the *Sutures of the Head*; it has kill'd ſome, and *Galen* is againſt it *L.* 2. *de Comp. Med.* I have ſomewhere read of a Man who, after a certain Conteſt for *Victory*, being very hot, took off his *Helmet* to refreſh himſelf after the *Victory* he had obtain'd; which *Helmet* his *Emulators* ſmear'd on the inſide with *Opium*: He afterward put it on, and ſoon died. 2. It

2. It is applied more safely to the *Forehead* or *Temples*, but the Quantity of *half a Scruple* should not be exceeded in this *Case*; *Fernelius* commends the Application of it to the Forehead in *Head-Aches*, *Phrenzies*, &c. mixed with *Ointments*; *Wedelius* did also use *Venice Treacle* and *Extract* of *Opium* to the *Temples* with good Success in *Pain* of the *Head*; he also found the like Success in applying it behind the *Ears*.

Note, That the Continuance and Constancy of its Operation, where it takes *Effect* applied *externally*, may be very beneficial in some *Cases*; but even that may be answered by *internal Use*, if it be repeated.

3. All, or most, do agree that it is too acrimonious to be applied to the *Eyes*.

4. *Geigerus*, *Fernelius*, *Heurnius*, &c. do commend its *Use* to smell to, being made into a *Ball* &c. with *odoriferous Things*; and I have an *Opinion* that this Way of using it may be excellent, conditioned, that not above *Half a Scruple* of *Opium* be used. 1. Because but a small Quantity, and that of its finest Parts, is thus received into the *Body*. 2. Because it may be removed at Pleasure, and then, (as some say) the *Effect* immediately ceases. This is very well worth the experimenting; for it would be very near to be able to cause *Sleep*, and its other *Effects* with *Safety*, as long, or as short a *Time*, as we please, and no longer; for this cannot be done, when it is *internally* given, but its Operation will have its Course, without extraordinary Means and Trouble; but when *externally* used, the very Cause of the Danger (if any should happen) can be immediately removed, by taking of the *Opiates* from the *Nose*.

5. That of *Geigerus*, and *Langius*, using only one *Grain* of *Opium* to the *Puncture*, or *little Wound* made

made by a *Leech* behind the *Ear* to cause *Sleep*; and that with *Effect*, seems to me to be attributed more to the *Bleeding*, which always inclines Men to sleep, than to the *Opium*.

6. Crude *Opium* has kill'd People by putting it in hollow *Teeth*, as some Observers aver.

7. Applied to the *Ears*, it relaxes, and (as it were) resolves the *Tympan* and other delicate *Membranes* concern'd, and thereby offends the Hearing.

9. *Galen* seems to be against the Application of it to the Nape of the Neck, because so near the Original of the *Nerves*.

Note, That it is not convenient to use it, where *Repletion*, and *Relaxation*, may do any Harm, as was said of the Tympan of the *Ear*, &c.

10. *Venice Treacle*, *Mithridate*, and *Diascordium*, are safely applied *externally* to the *Region* of the *Stomach*, to appease *Vomiting* and *Hiccoughs*, *moderate Looseness*, &c.

11. *Savanarola* and *Octavius Horatianus* used it to the Navel to cause *Sleep*; and with *Rue*, *Myrrh*, *Frankincense*, and *Wax*, to move to *Stool*; which it perform'd (as the last mentioned *Author* says.)

12. *Sylvius* uses it in his *carminative Plaister* to discuss Wind, which is rational.

13. Some of the *Ancients* applied it to the *Perinæum*, *Kidneys*, *Region* of the *Pubis*, &c. to chill *Venus* by the *cold Quality* they attributed to it, which is all *Stuff* grounded upon that most absurd *Hypothesis*.

14. They also attributed its *Pilotbrick* Quality to *Cold*; than which nothing does more fasten, and cause the Hair to grow; as you see in *Winter-Time*, when all *Furrs* are longer, and fastned better to the Skin. Into what *Fooleries* a false *Opinion* will lead People.

15. It

15. It has been used by *Hieron Mercurialis* in *Ulcers* of the *Womb* with Success, and without danger, as he says, *L. 4. de Morb. Mul. c. 7. p. 281.*

16. It has kill'd People in *Clysters* by sticking to the *Intestinum rectum*, which was doubtless by Reason of its *Rosin*, for it has nothing in it besides the *Rosin* that can stick to do any manner of Harm; which is a most *demonstrative Reason* of the *Perniciousness* of its *Rosin*, for if it can kill there, much more where there is such exquisite *Sensation*, as is at Stomach.

However, 'tis known by Experience that *Venice Treacle* and *Diascordium* are, because of the Dissemination of the *Opium*, and smallness of the Quantity, safe in *Clysters*, and very useful in *Dysenteries* and *Diarrhœas*, as our *Panacea* must be, that has no *Rosin* in it, and dissolvable in *Water*, or any Humours of the Body.

17. It may be used in *Suppositories* when the *Rosin* is separated from it; but I would not advise the *Use* of above 4 *Grains* in this Case; or if 8 or *ten* be used, the *Suppositary* should not remain long in the *Body*. This I say for Caution's sake.

18. It has been used reduced to an *Ointment* or *Balsam* with *Oil of Roses*, &c. to the Soals of the *Feet*, to cause *Sleep*, with good Success. *Valentius Polidamus, L. de Doloribus Capitis. p. 78.*

19. *D. Francisc. Hildesheim* asserts, that it takes away *Pain* in *Cauteries*, but says it is apt to cause *Grangrens*.

20. *Crollius* in his *Basil. Chym. p. 235.* says, That 2 Pills of *Opium*, each containing 8 Grains, being put up into the *Nostrils*, stopt a desperate *Hæmorrhage* at *Nose*; but I should hardly trust it in this Case. Possibly the *Blood* might stop by some other Cause, a small *Deliquium* not observed, or the like; for *Deliquiums* still all Motion by a sudden *Relaxation* which (as has been said) suspends

all Humours, and weakens the Motion of the Heart, (if it does not sometimes quite take it off) for the Time.

Secondly, as an *Alterative Emplastick*, &c. it (as was shown) *incides, resolves, discusses, mollifies, maturates, suppurates*, and is *pilotbrick* and *titillative*; Therefore is of *Use*,

1. In *Phlegmatick* and *Oedematous Tumours*.

2 In *windy Tumours*, *Pains*, *Stitches*, &c.

3. *To ripen Boils*, *Buboes*, *Abscesses*, and the like.

4. *In all hard Tumours* of the *Spleen*, *Breasts*, *Cancers*, *Tophousness*, &c. in which *Cases* it is (as other *Opiates* are) of excellent *Use*, by their powerful *resolving* and *relaxing Faculties*.

5. *To cause Nourishment of Parts*, Increase of Milk, *&c.* by *Relaxation*; as *Sleep*, *Puberty*, *Pleasure*, &c. do (as has been shown.)

6. *To cause the shedding of Hair* by *Resolution* of the *Parts*, as by a *Caustick*, *Vesicatory*, &c. with which it agrees in its exulcerating Faculty, when it is very strong, as the true *Maslach* (or *Snuff*) which we have not.

7. *To excite to Venery* by its *titillating Volatile Salt*, if apply'd to the *Perinæum*.

YE *blessed Minds!* who in an instant know
What in five Thousand Years none here below
Could learn! How mean are we? how great are you?
O, for your happy State! while dull Mankind
Oft' *see* and *feel* the Things they *cannot find*,

Who

Who did not *see* the Bloud *move to and fro?*
Yet could none its *Circulation* know,
Till *God* enlighten'd *Harvey*; then did he
Perceive what others *seeing* could *not see.*
So till *God* was to my Enquiries kind,
Millions sought and felt what they ne're could find.
What is vain Man, without th' *all knowing Mind?*
To whom all Glory be, all Thanks, and Praise,
As was, is now, and fit to be always.

Amen. Amen. Amen.

FINIS.